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ABSTRACT

Designed to supplement any standard textbook in the first-year level of related drafting instruction for carpentry, this manual contains original illustrations on graphic representation, pictorial representation, working drawings, and structured building details (exterior and interior). It consists of five units with separate lessons for each: (1) Graphic Representation (American Standards Association Principles of Projection, Spacing Views on Drawing Paper, Drawing Required Views, Developing the Third View from Two Views, Completing Views by Filling in Missing Lines, Freehand Orthographic Sketching); (2) Pictorial Representation (Freehand Sketching, Isometric, Oblique, Cabinet); (3) Working Drawings (Importance of Working Drawings for a One-Story House, Elevation Views, Commonly Used Abbreviations for Elevation Terms, Symbols and Conventions for Elevations Views, Plan Views, Commonly Used Abbreviations for Plan Terms, Symbols and Conventions); (4) Structural Building Details--Exterior (Framing, Roof, Siding, Cornices, Window Frames, Door Frames); (5) Structural Building Details--Interior (Window Sash, Doors, Walls, Floor, Ceiling, Stairs, Cabinets). The appendices contain drawings of tree trunk cross-sectioning, sawing of lumber, common cuts in wood, common wood joints, and nails. A wood screws table, a chart of American Standard plumbing symbols, and a 37-item short-answer test are also included. (HD)

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ED127458

State of New Jersey
Department of Education
Division of Vocational Education

CARPENTRY
BLUEPRINT INTERPRETATION

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U S DEPARTMENT OF HEALTH, EDUCATION & WELFARE
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INTRODUCTION

The creation of the building industry involves four phases: FIRST, the development of ideas of design – the architect; SECOND, the execution of the idea – the draftsman; THIRD, the reading of blueprints – the builder; and FOURTH, fabrication of the parts comprising the physical structure – the carpenter.

The carpentry learner should be taught the third phase: Building Blueprint Reading and Interpretation, and the fourth phase: Fabrication of the Parts for Mass Production.

Carpenters, the largest group of building trades workers, are employed in almost every type of construction activity. They erect the framework of buildings including sheathing, partitions, floor joists, studding and rafters. When the building or the house is ready for trimming, they install moldings, wood paneling, windows, doors, as well as build stairs and lay floors.

As part of their job, carpenters also saw, fit and assemble plywood, wallboard and other materials. They use nails, bolts, wood screws, or glue to fasten materials. Carpenters use handtools such as hammers, saw, chisels, planes, and power tools such as portable power saws, drills, and rivet guns.

It is important for young men interested in entering the carpentry trade to obtain all-round training including the kind given in related instruction classes in drafting and blueprint reading, mathematics applicable to layout work, and the use of woodworking machines.

In the shop and in the related subjects he learns the relationship between carpentry and the other building trades, because the work of the carpenter is basic to the construction process. The student learns elementary structural design and becomes familiar with the common system of frame and form construction. He learns to use, care for, and handle safely the tools, machines, equipment and materials used in the trade. He also learns, among other things, how to build forms for holding concrete, framing, outside and inside finishing work, how to fit hardware, how to hang doors and set windows and how to lay out work.

Carpenters have greater opportunities than most building craftsman to become general construction foremen, since carpenters are familiar with the entire construction process and the area of specifications.

Specifications are grouped by trades into two main divisions: CONSTRUCTION WORK: Excavation, Masonry, Carpentry and Painting; and MECHANICAL WORK: Heating, Sanitation and Electrical. The carpenter must be able to interpret the lines and symbols which apply to the mason, plumber, electrician, etc., because each man's work is dependent upon another's.

Since methods of construction vary with different individuals, depending upon past experience, it is always well to bear in mind that there is NO ONE BEST METHOD. The method used in this class will be just another way of doing a particular job. The work has been designed in such a manner as to permit the instructor to use it with any standard textbook that he prefers.

The author has included original illustrations to provide supplementary instruction for use at the first year level of related drafting instruction for carpentry.

The author is indebted to Mr. Stephen Poniatowski, Principal of Thomas A. Edison Vocational-Technical High School, for making available the opportunity to write this work.

Gratitude is expressed by the author to Mr. Benjamin Shapiro, Director of the Vocational Technical Curriculum Laboratory, Rutgers – The State University, for his advice and efforts toward the realization of the finished work.

Vojkan Nikol

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UNIT I - GRAPHIC REPRESENTATION

Lesson 1 A. S. A. Principles of Projection

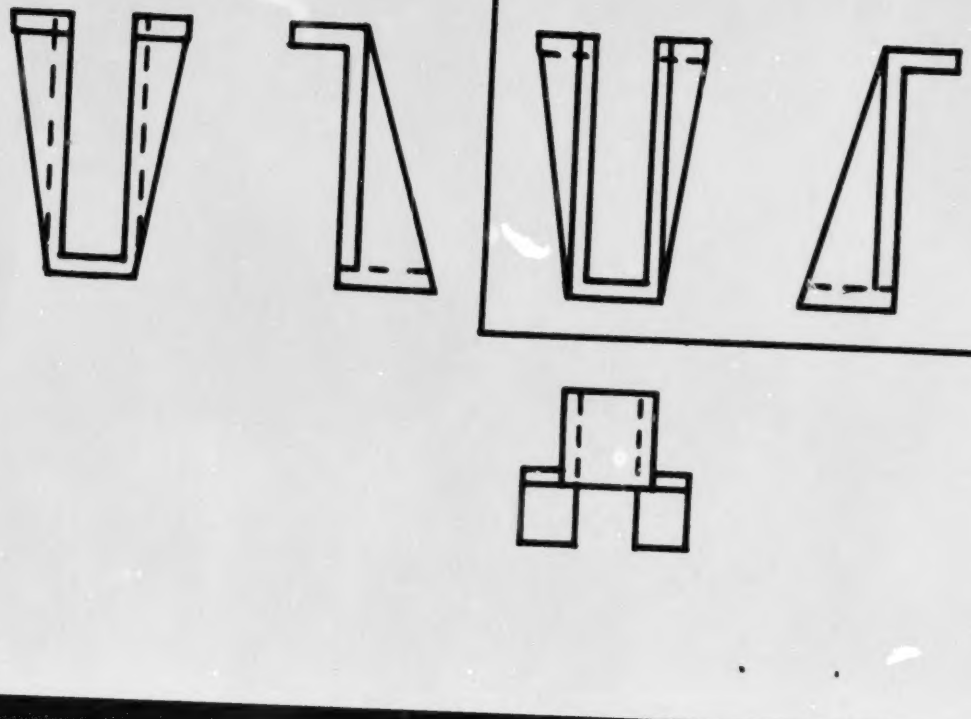
INFORMATION:

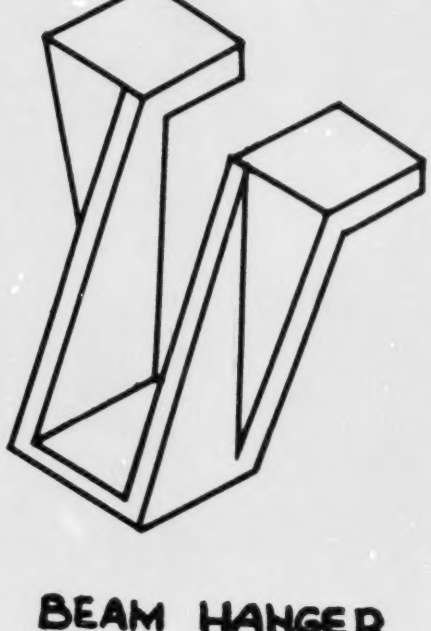
Any rectangular object can have as many as six views. Some views may be omitted, but arrangement of the views should not be drawn in any other position. The observer looks perpendicularly toward each side of the object and then, omitting repetition of information, he selects the views necessary to describe the object. This idea of representing objects having length, width, and thickness on a piece of paper is the idea in back of all types of projection.

The key to blueprint reading is an understanding of representation of an object having three dimensions on a single surface – the paper – which has only two dimensions – length and width. This type of projection is called orthographic.

AMERICAN STANDARD OF PROJECTION

THE THREE MOST COMMONLY USED VIEWS





BEAM HANGER

INFORMATION:

Suppose you are to make half-scale views of an object. Where will you locate them on your paper?

An easy way is to add the length and width of the object, and then take half of this (for half-scale views). Subtract this number from the working length of your paper.

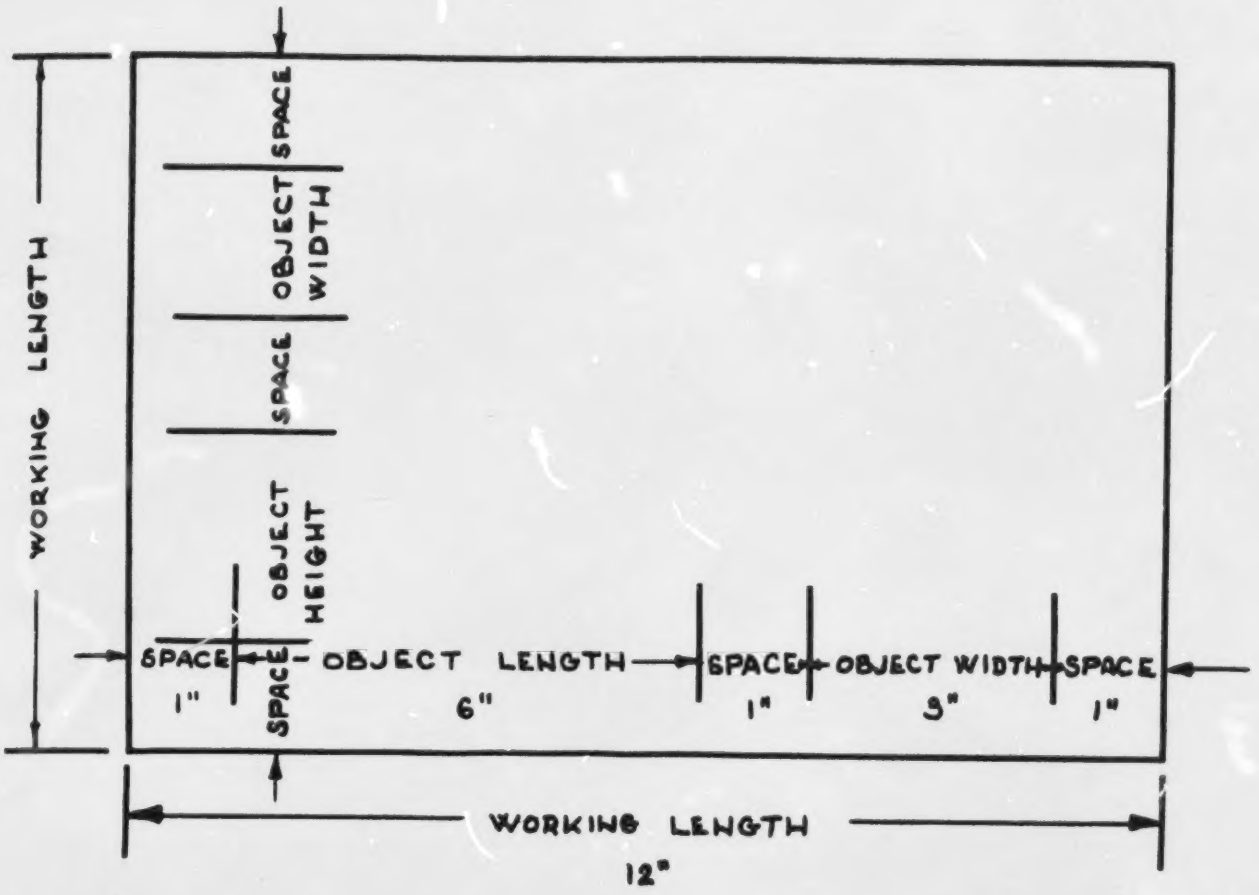
For example, here is how you would space the views for a 6" X 12" object.

Object Length	12 inches front view
+ Object Width	6 inches side view
Full Size	18 inches
Half Size	9 inches
Working Length	12 inches
Object	9 inches
	3 inches

The remaining distance of 3 inches should be divided into three parts to provide a space between the views, a space at left of the front view, and a space at the right of the side view.

For spacing the top and front view, the same method should be used.

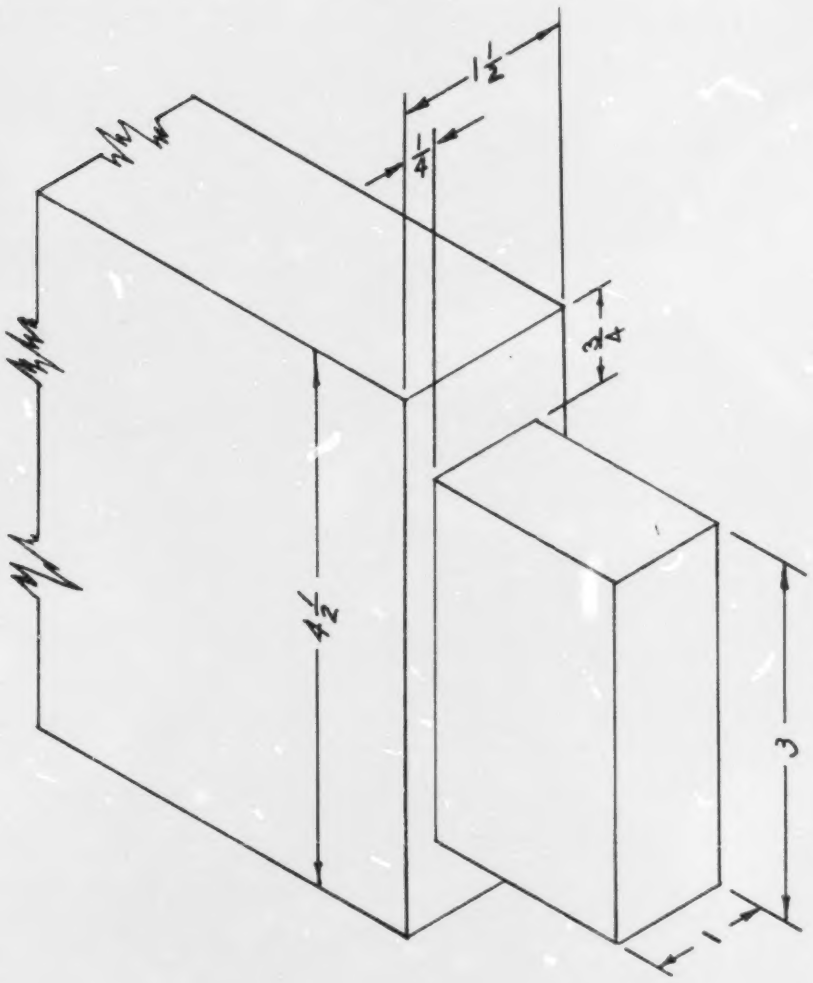
The spacing on your paper is shown on the next page.


WORKING LENGTH
SPACE
OBJECT WIDTH
SPACE
OBJECT HEIGHT
SPACE
SPACE
OBJECT LENGTH
SPACE
OBJECT WIDTH
SPACE
1"
1"
6"
1"
3"
1"
WORKING LENGTH
12"

INFORMATION:

Pictorial drawing of a rail is given. Draw three views – half size.

The rail is the horizontal member of the stool which joins with or fits into a mortise.

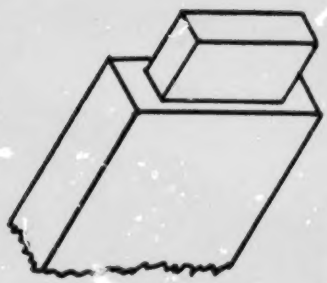


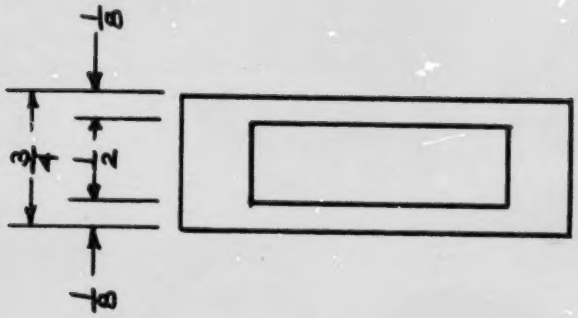
DETAILS OF A FOOTSTOOL

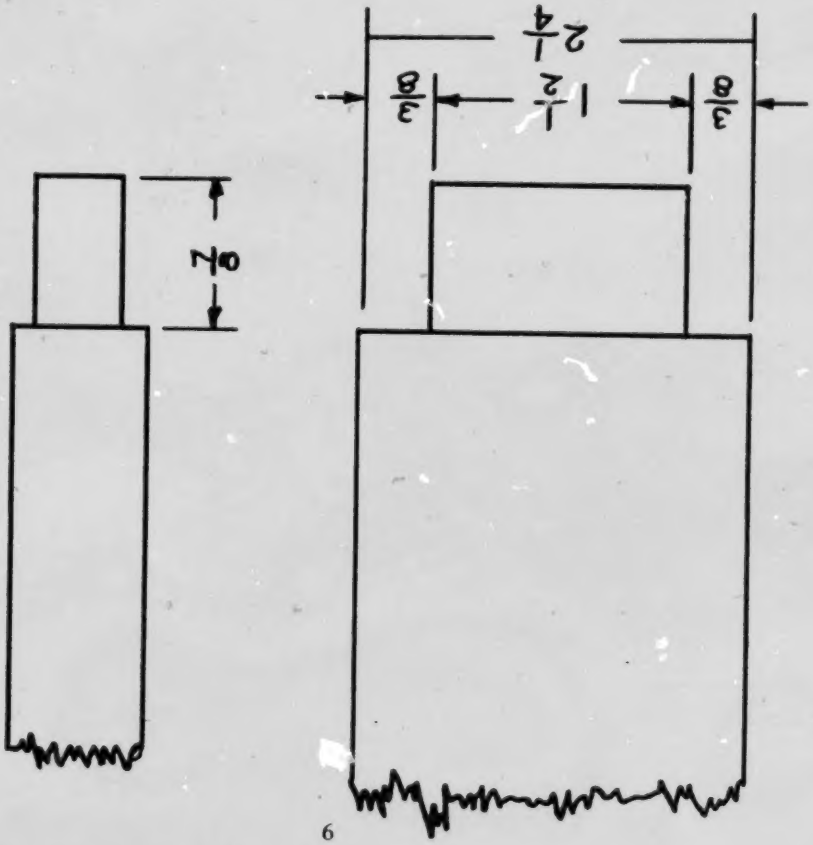
RAIL

DETAILS OF A FOOTSTOOL RAIL

SCALE : HALF SIZE





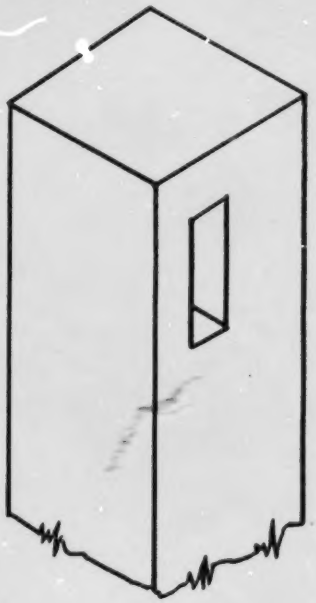


6

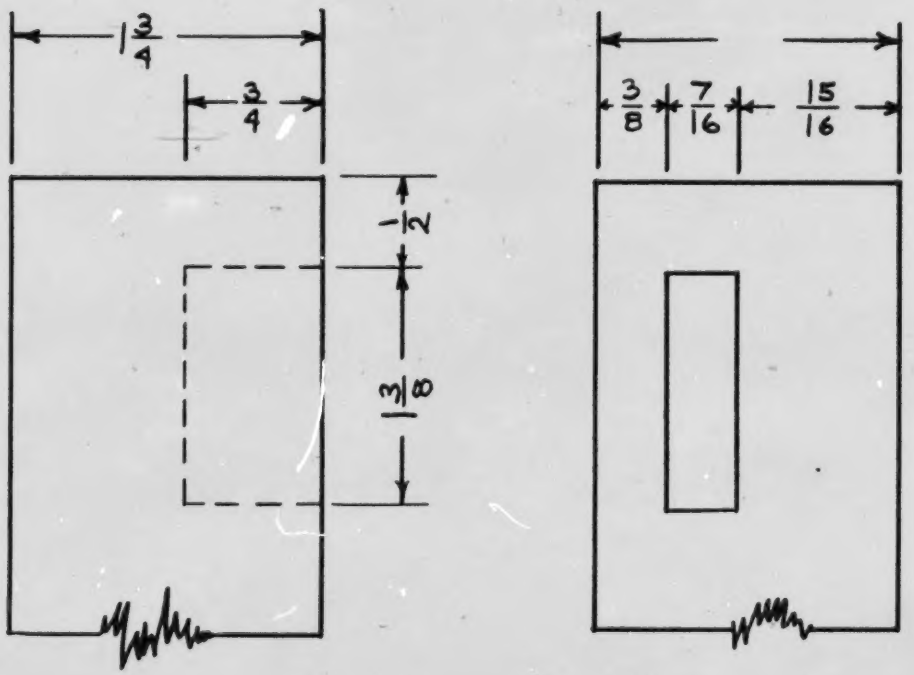
INFORMATION:

Detail of a table leg mortise is given. Draw missing view.

The mortise is the hole into which the tenon on the end of the other piece is to fit.



DETAILS OF A TABLE LEG MORTISE

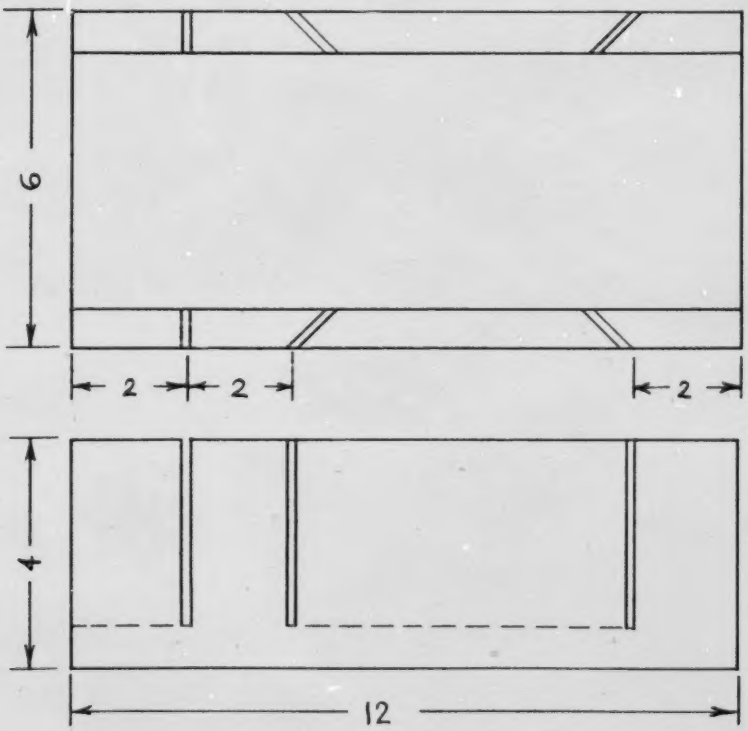


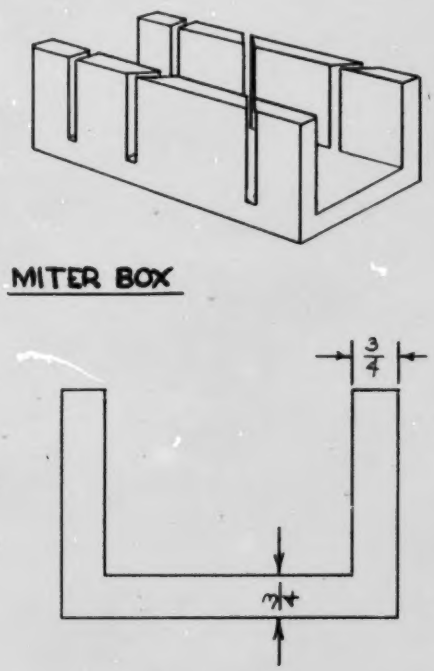
Lesson 5

Completing Views by Filling in Missing Lines

INFORMATION:

There are three views given of a miter box and lines have been omitted intentionally.





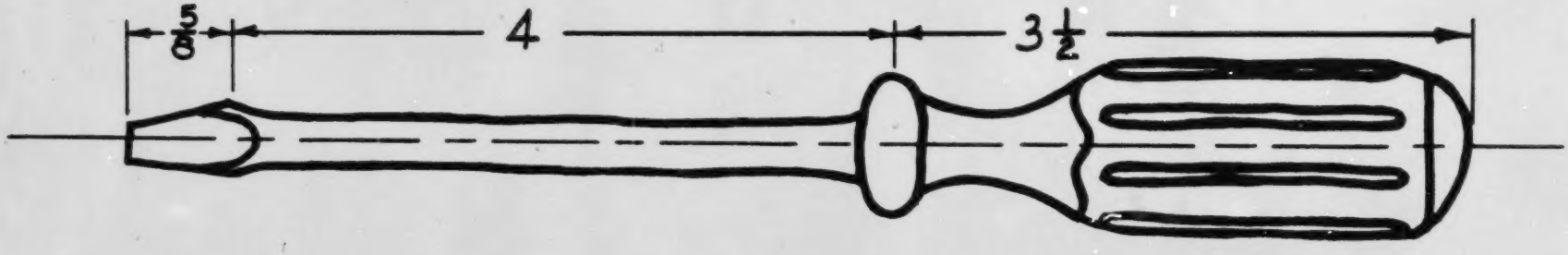
INFORMATION:

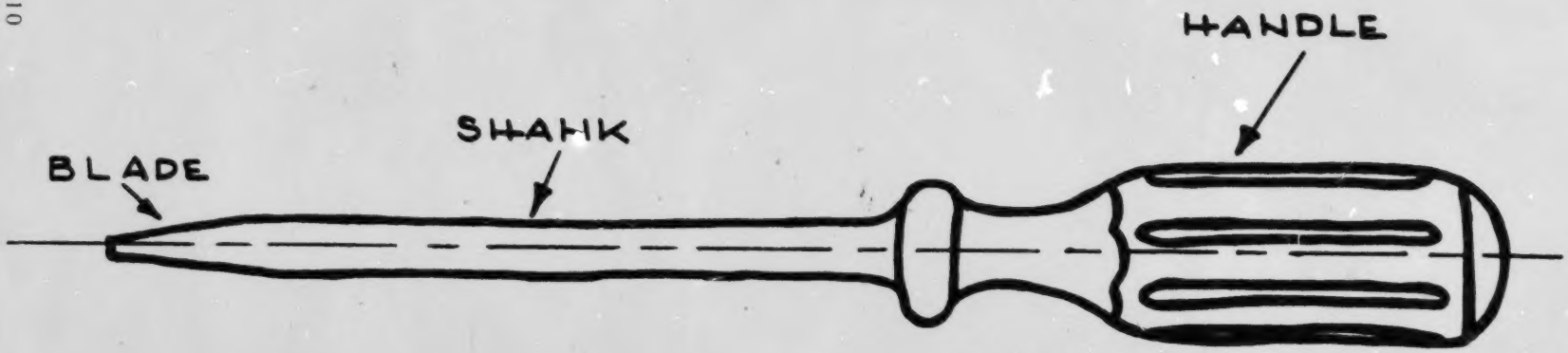
To do freehand sketching, the following procedure should be followed:

1. Study the object and designate the number of views needed.
2. Draw the object lines.
3. Draw the center line if the object is symmetrical.
4. Draw hidden lines if necessary.
5. Draw extention and dimension lines.
6. Measure the object, placing each dimension on the sketch as it is taken.
7. Title the object.

SCREWDRIVER

SCALE: FULL SIZE





UNIT II - PICTORIAL REPRESENTATION

Lesson I — Freehand Sketching - Isometric and Oblique

INFORMATION:

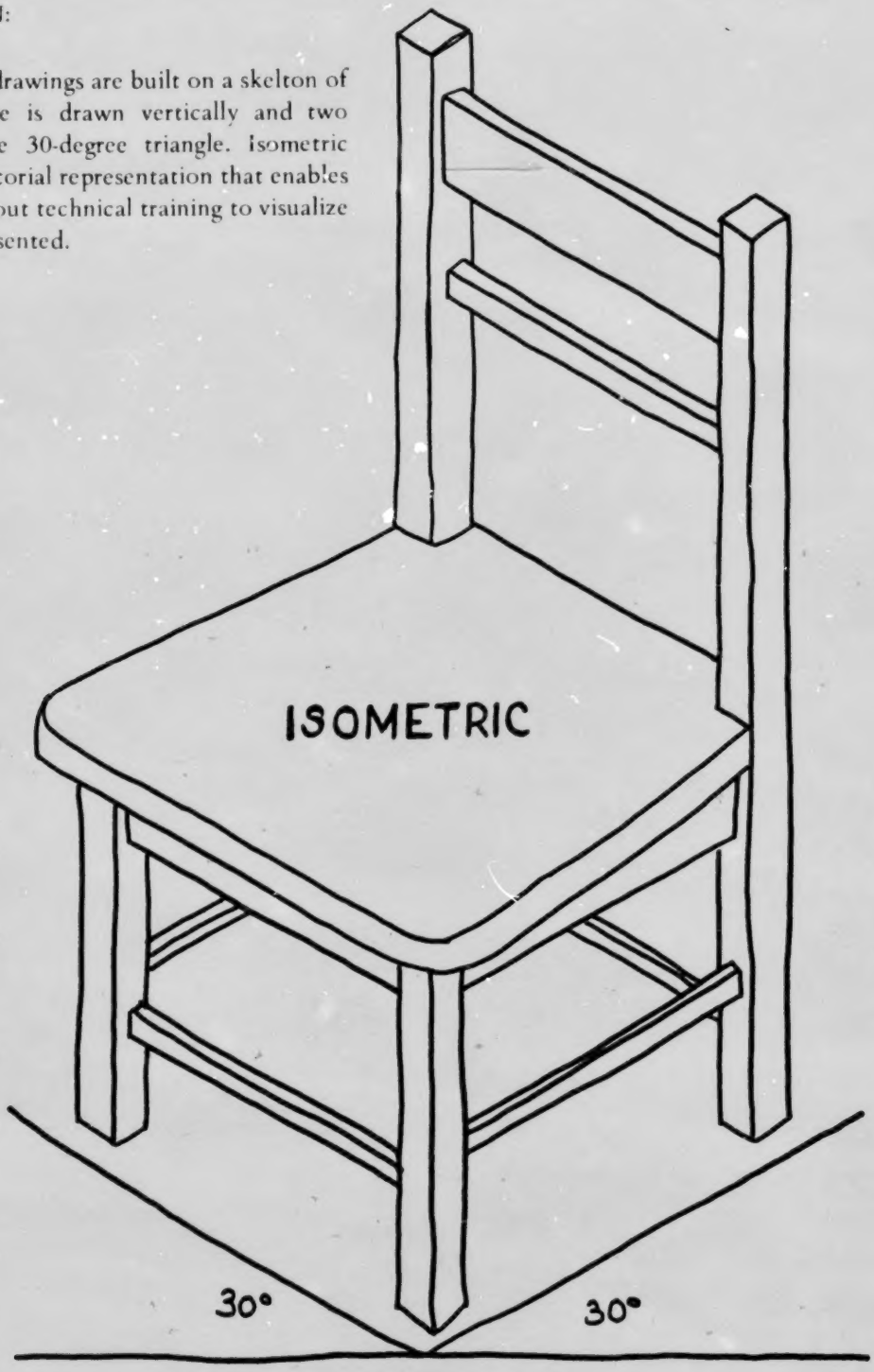
An acceptable sketch may be described by the rule: Good lines – both straight and curved – plus correct projection – plus accurate proportion. If any one of these three fundamentals is faulty, the sketch is poor and may be incorrect.

One can develop accuracy in judging dimensions of an object by eye. It merely takes practice. But to draw a well-proportioned object, you must develop this skill.

Isometric and oblique projection are two types of pictorial representation. Only the appearance should be different.

INFORMATION:

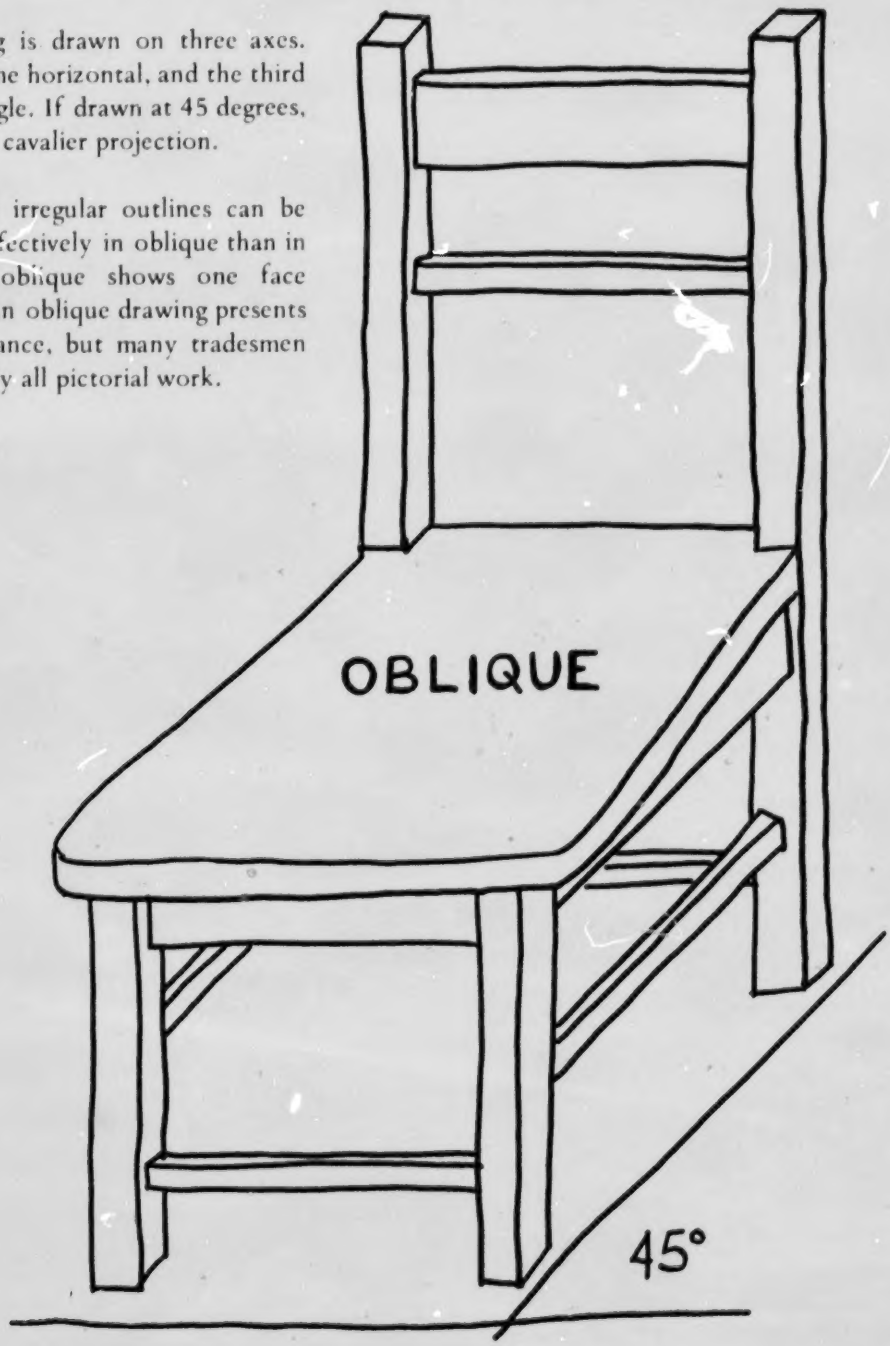
Isometric drawings are built on a skelton of three lines. One is drawn vertically and two others with the 30-degree triangle. Isometric drawing is a pictorial representation that enables the person without technical training to visualize the object represented.



INFORMATION:

Oblique drawing is drawn on three axes. One axis is vertical, one horizontal, and the third at any convenient angle. If drawn at 45 degrees, it is commonly called cavalier projection.

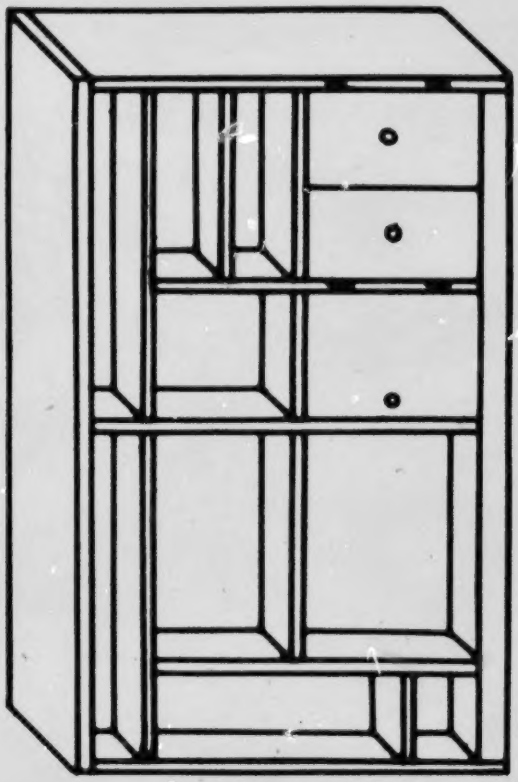
An object with irregular outlines can be drawn much more effectively in oblique than in isometric, because oblique shows one face without distortion. An oblique drawing presents an unnatural appearance, but many tradesmen prefer it for practically all pictorial work.

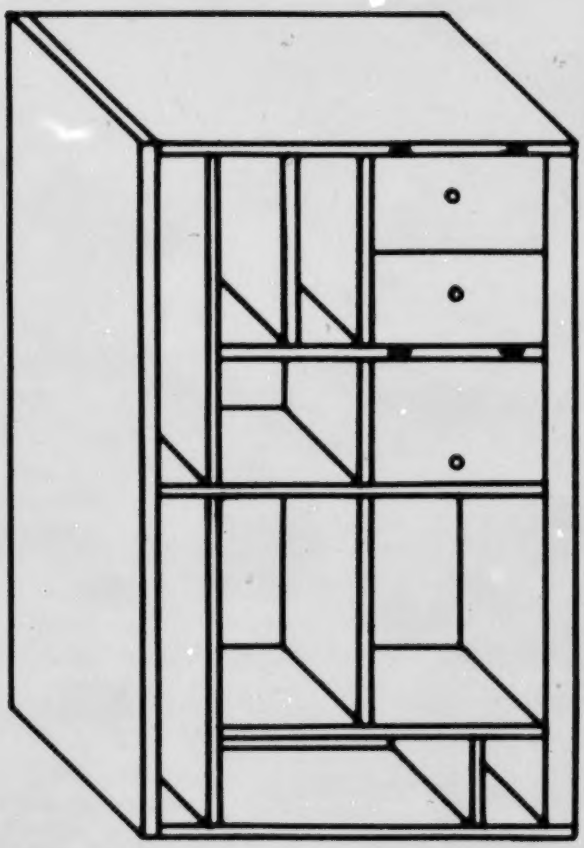


INFORMATION:

Cabinet drawing is the same as oblique drawing, except that all thickness measurements from front to back are reduced one-half. The term cabinet drawing is attributed to the early use of this type of oblique drawing in the furniture industry.

CABINET





OBLIQUE

UNIT III - WORKING DRAWINGS

Lesson I — Importance of Working Drawings for a One-Story House

INFORMATION:

Working drawings are a very important form of drawing because they give directions for doing work. They should, therefore, show the exact shapes and give exact dimensions or size.

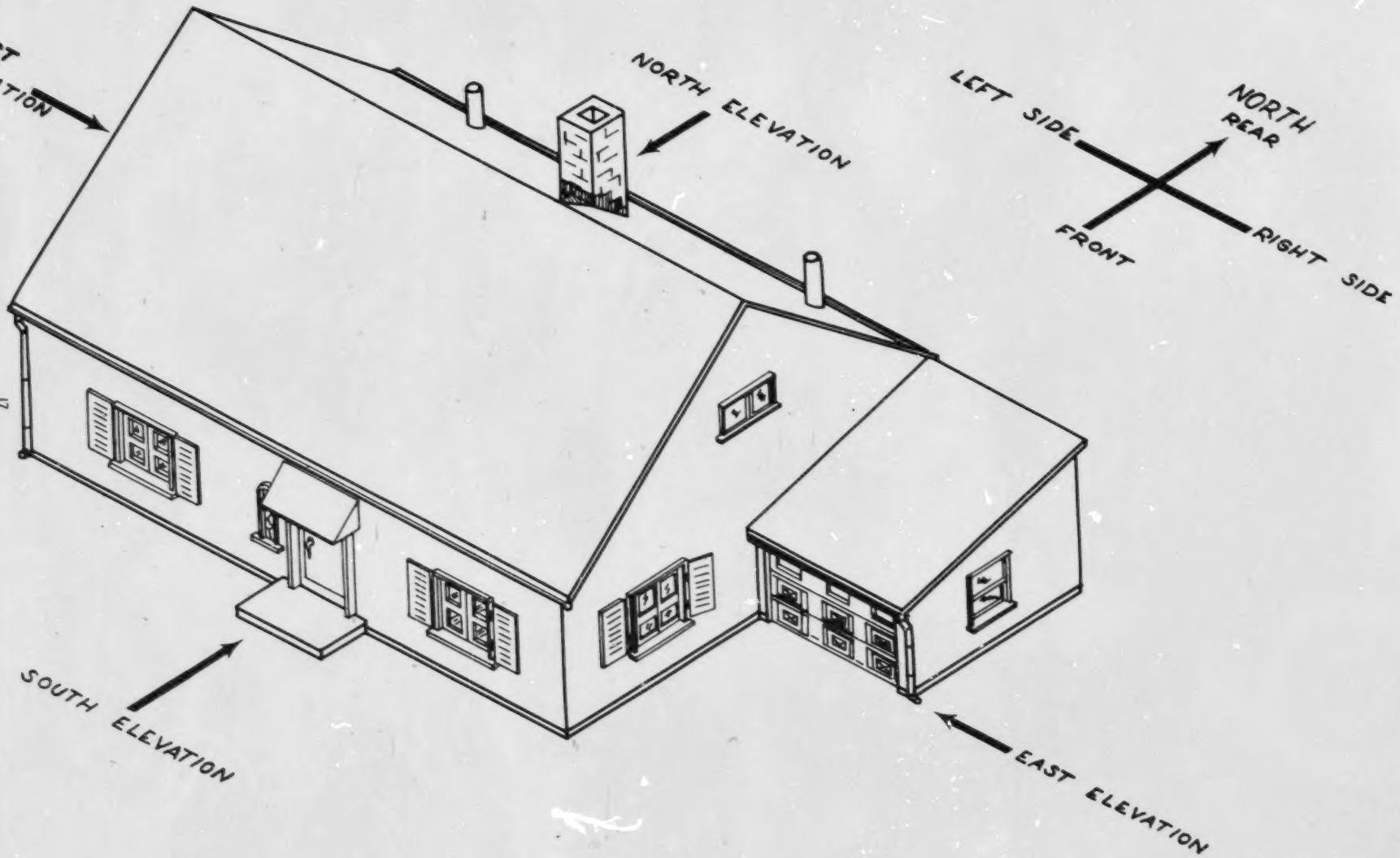
Working drawings and specifications should be very carefully prepared so that they give all information necessary for an accurate estimate of all materials and labor needed for construction of the house. For this purpose orthographic projections are used.

INFORMATION:

So that the various elevations can be named without confusion, they are generally designated as north, south, east, and west elevations, according to the way the house faces. But some builders prefer to designate the views front, rear, left, and right elevations.

The house shown on the next page faces south and the front is therefore called the south elevation.

When drawing, you can save a great deal of time if the front and right side (south and east) elevations are developed together. The same procedure should be followed in drawing the rear and the left side (north and west) elevations.


WEST ELEVATION
NORTH ELEVATION
LEFT SIDE
NORTH REAR
FRONT
RIGHT SIDE
SOUTH ELEVATION
EAST ELEVATION

Lesson 3

Commonly used Abbreviations For Elevation Terms

INFORMATION:

The following terms and abbreviations are very much in use to save time and to avoid unnecessary drawing of details that are in general use.

Building	BLDG
Ceiling	Clg or CLG
Cement	CEM
Concrete	CONC
Copper	COP
Corner	COR
Diameter	diam. or DIA or ϕ
Dimension	dim. or DIM
Door	DR
Double-hung Window	DHW
Drawing	DWG
Elevation	EL
Entrance	ENT
Exterior	EXT
Flashing	FL
Floor	FL
Foot or Feet	' or ft. or FT
Glass	GL
Grade	GR
Height	HGT or H or HT
Inch	" or in. or IN
Level	LEV
Light	LT
Long	LG
Mullion	Mull
Number	NO. or No. or #
Opening	OPNG
Panel	PNL
Perpendicular	PERP

Radius	r or R
Roof	RF
Saddle	SDL or S
Scale	SC
Sheathing	SHTHG
Sheet	SH
Siding	sdg or SDG
Square	Sq or SQ or □
Vertical	VERT
Width	W or Wth
Window	WDW
Wood	WD
Yard	yd. or YD

Lesson 4

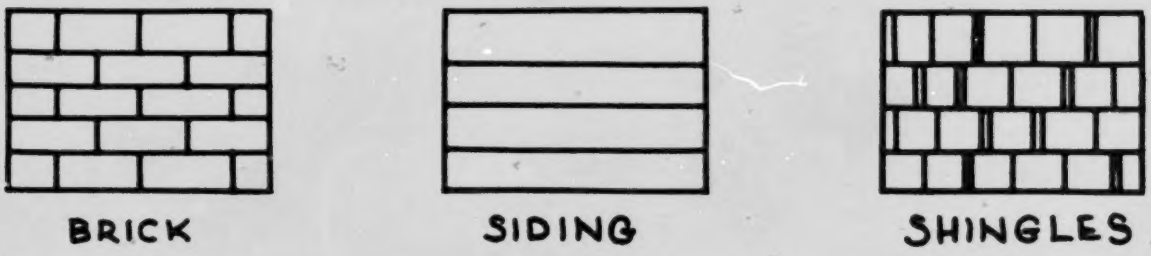
Symbols and Conventions For Elevation Views

INFORMATION:

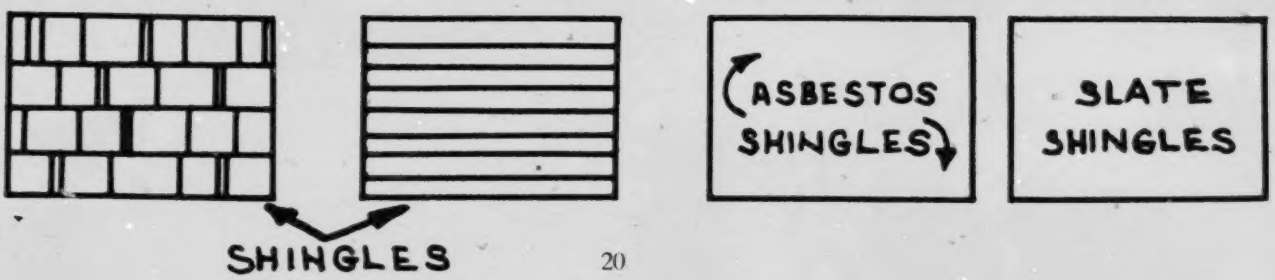
In order to show various materials such as wood siding, brick, shingles, etc., the builder uses what are called symbols. The most commonly used symbols are shown below.

Items such as chimneys, doors, windows, and shutters, large enough to be recognized easily on small-scale drawings, are drawn exactly as they would appear if viewed from a point directly in front of them.

WALLS



ROOFS



Lesson 5 — Plan Views

OBJECTIVE:

To draw a simple floor plan when room dimensions and room arrangements are given.

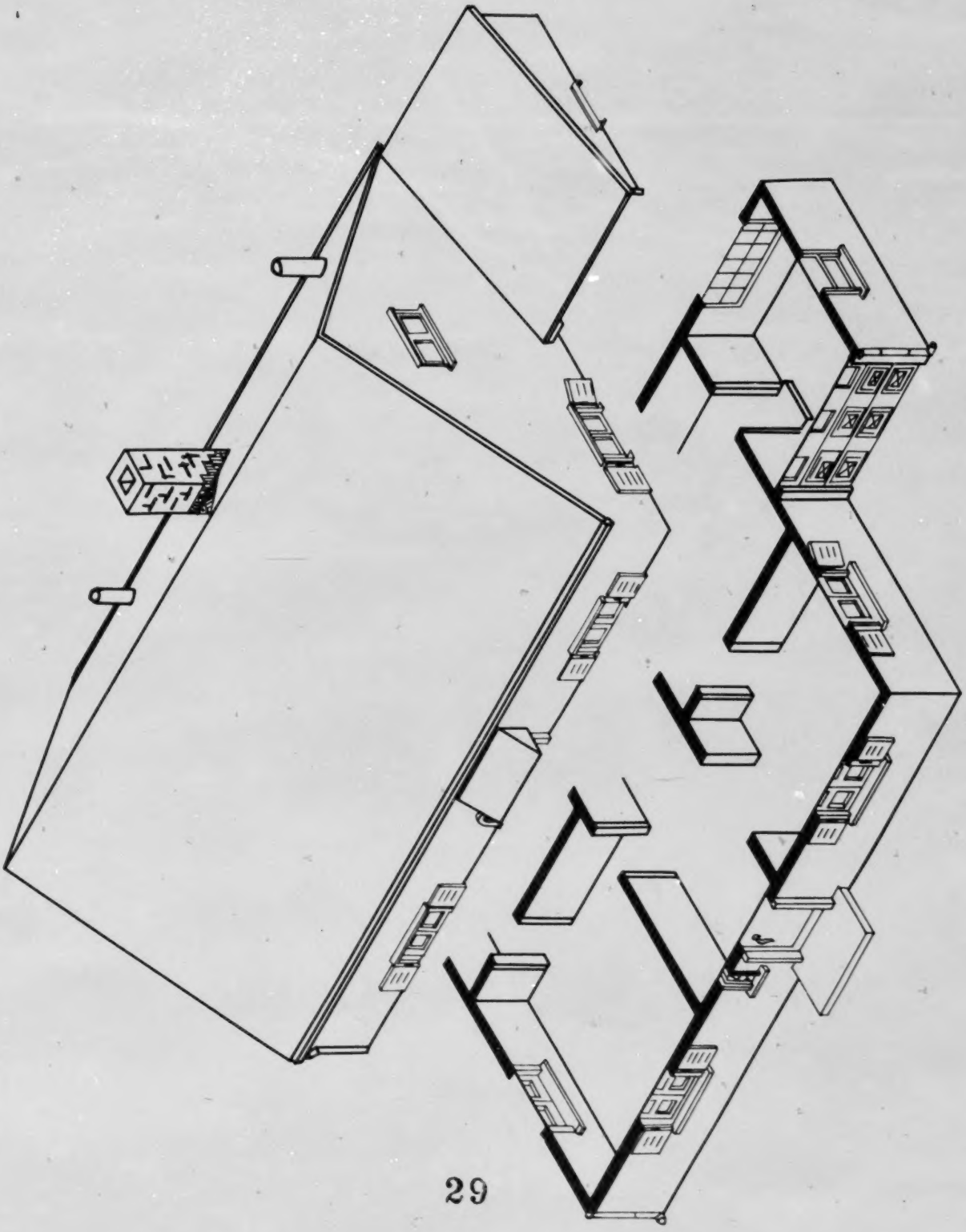
INFORMATION:

Rooms:

- Bedroom
- Living Room
- Dining Room
- Kitchen
- Bathroom
- Basement – unfinished
- Attached garage

Concrete footings and foundation
Box-sill construction
Double-hung window; standard casement; steel frame window

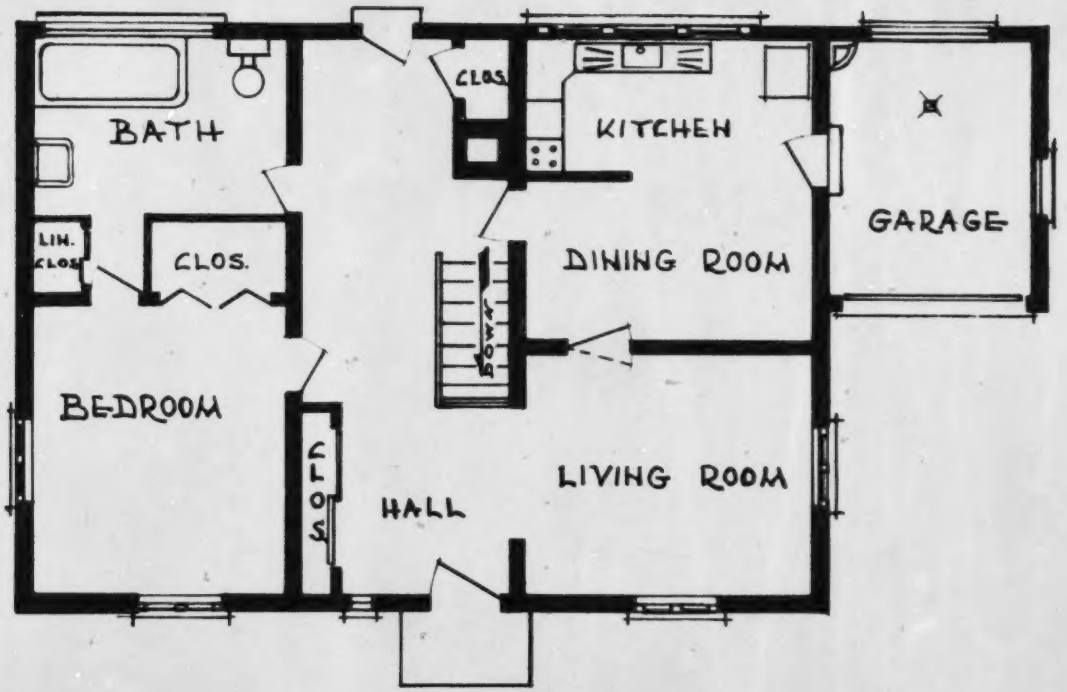
Suitable entrance door
Siding 10 inches to weather
Gable Roof (Asphalt shingles)
Garage – shed roof (Asphalt shingles)
Attic unfinished



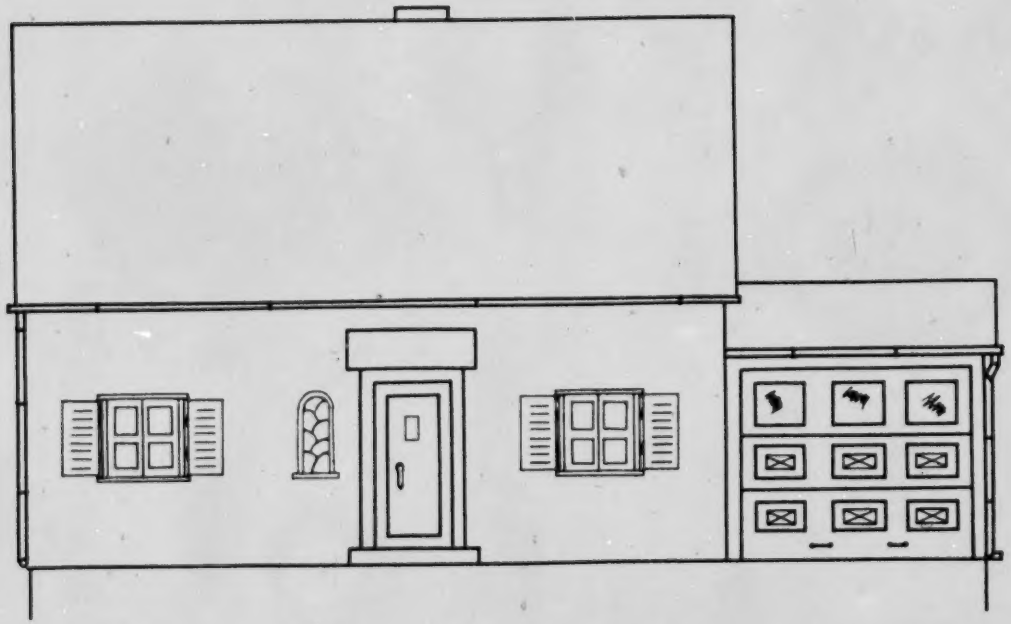
29

WRONG
RIGHT

FLOOR PLAN

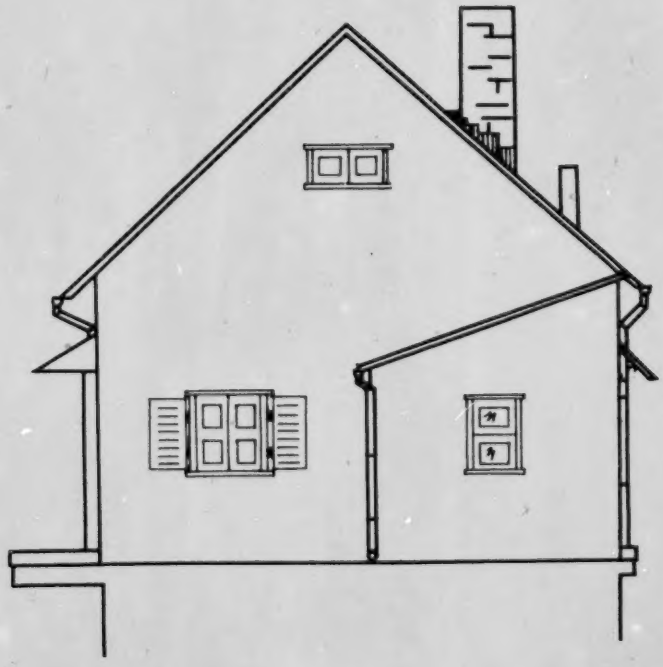

BATH
CLOS.
KITCHEN
GARAGE
LIN. CLOS.
CLOS.
DINING ROOM
BEDROOM
CLOS.
HALL
LIVING ROOM

SOUTH ELEVATION



- FRONT -

EAST ELEVATION

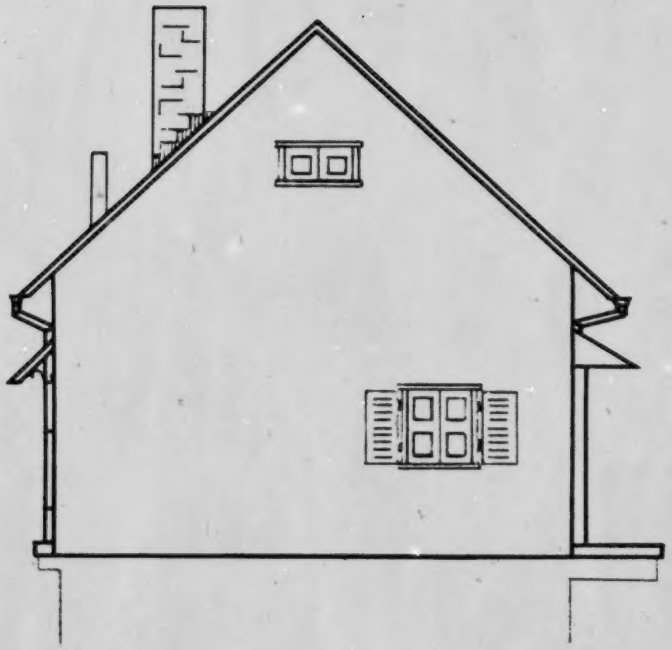


- R. SIDE -

NORTH ELEVATION

- REAR -

WEST ELEVATION



- L. SIDE -

32

25

Lesson 7

Commonly Used Abbreviations For Plan Terms

INFORMATION:

The following abbreviations for plan terms are generally used. Some are standardized, but some are in use without approval by American Standard Association.

Angle	∠
Apartment	APT
Asphalt	ASPH
Basement	BSMT
Bathroom	B
Bath Tile	BT
Beam	BM
Bedroom	BR
Blueprint	BP
Book shelves	BK SH
Broom Closet	BC
Cabinet	CAB
Cement Floor	CEM FL
Center	CTR
Ceramic	CER
Circuit Breaker	CIR BKR
Closet	CLO
Cold Water	CW
Detail	DET
Diagram	DIAG
Dining Room	DR
Double-acting door	DAD
Drain	D or DR
Finished Floor	FIN FL
Fluorescent	FLUOR
Foundation	FND
Frame	FR
Full Size	FS
Garage	GAR
Gas	G
Hall	H

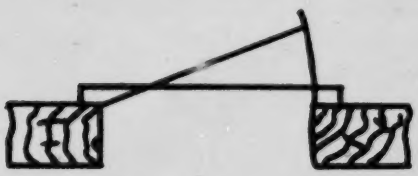
Hardware	HDW
Hot Air	HA
Hot Water Tank	HWT
Interior	INT
Kitchen	K
Linoleum	LINO
Living Room	LR
Louver	LV
Medicine Cabinet	MC
Miscellaneous	MISC
Nosing	NOS
Outlet	OUT
Plaster	PLAS
Refrigerator	REF
Register	REG
Room	RM or R
Sink	SK or S
Square Feet	Sq. ft.
Stairs	ST
Standard	Std. or STD
Switch	SW or S
Threashold	Th
Utility Room	URM
Vent	V
Water	W

INFORMATION:

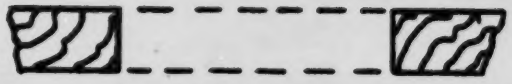
In order to understand plan views, it is necessary that typical symbols be learned. The common plan view symbols are shown.

DOORS

INSIDE



OUTSIDE

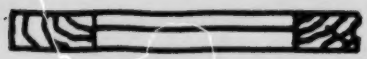


ARCHED or CASED OPENING

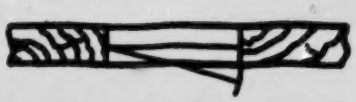
SLIDING

DOUBLE ACTING

WINDOWS



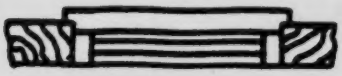
STATIONARY



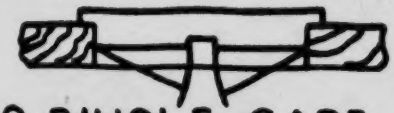
SINGLE CASE

DOUBLE HUNG

PAIR MULLION CASE

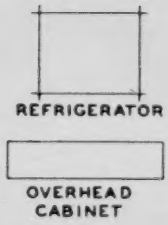


DOUBLE HUNG



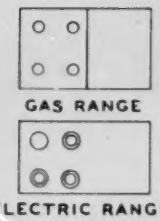
2 SINGLE CASE

KITCHEN TABLE



REFRIGERATOR

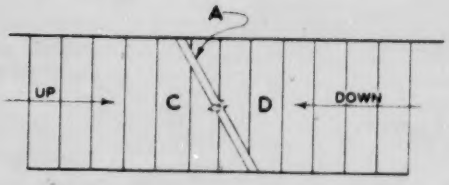
OVERHEAD CABINET



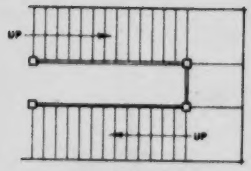
GAS RANGE

ELECTRIC RANGE

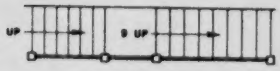
STAIRS



STRAIGHT RUN



OPEN NEWEL



STRAIGHT RUN

UNIT IV - STRUCTURAL BUILDING DETAILS - EXTERIOR

Lesson I — Framing

INFORMATION:

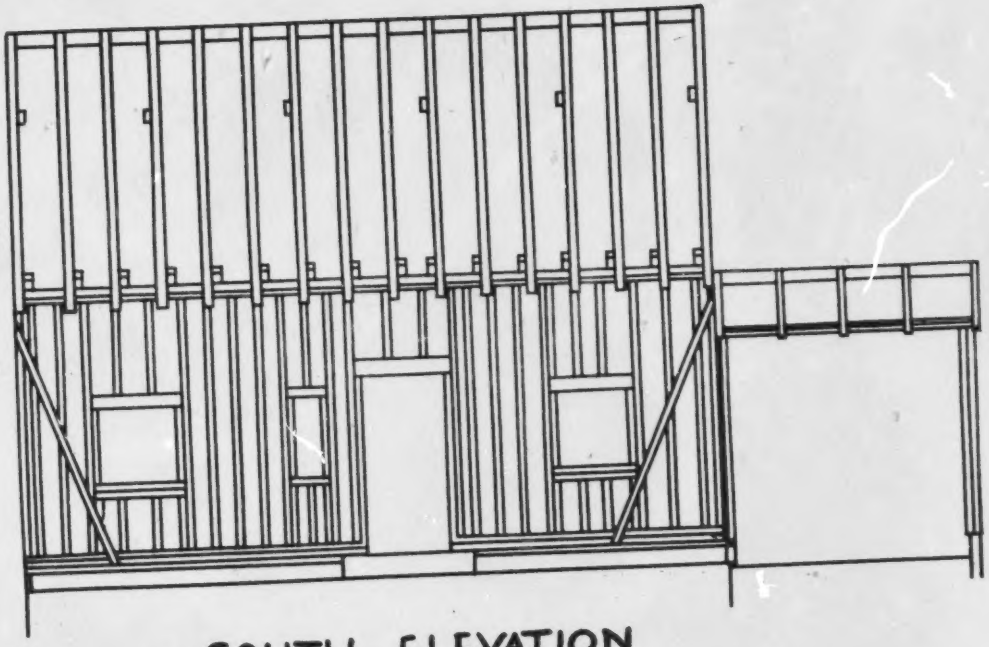
Framing the house is a complex job which demands careful development of roof, siding, walls, window and door framing, etc.

There are three primary essentials in building a satisfactory house:

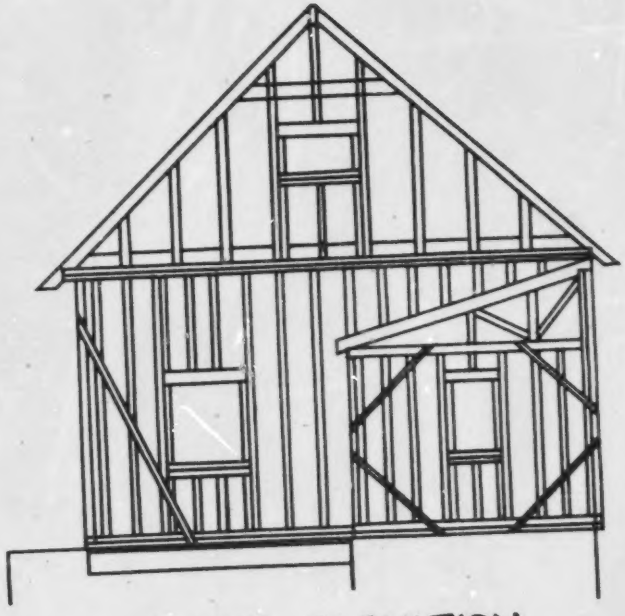
1. An efficient plan
2. Suitable materials
3. Sound construction

The house may be large or small, modern or traditional, but without these essentials it may be neither permanent nor satisfactory.

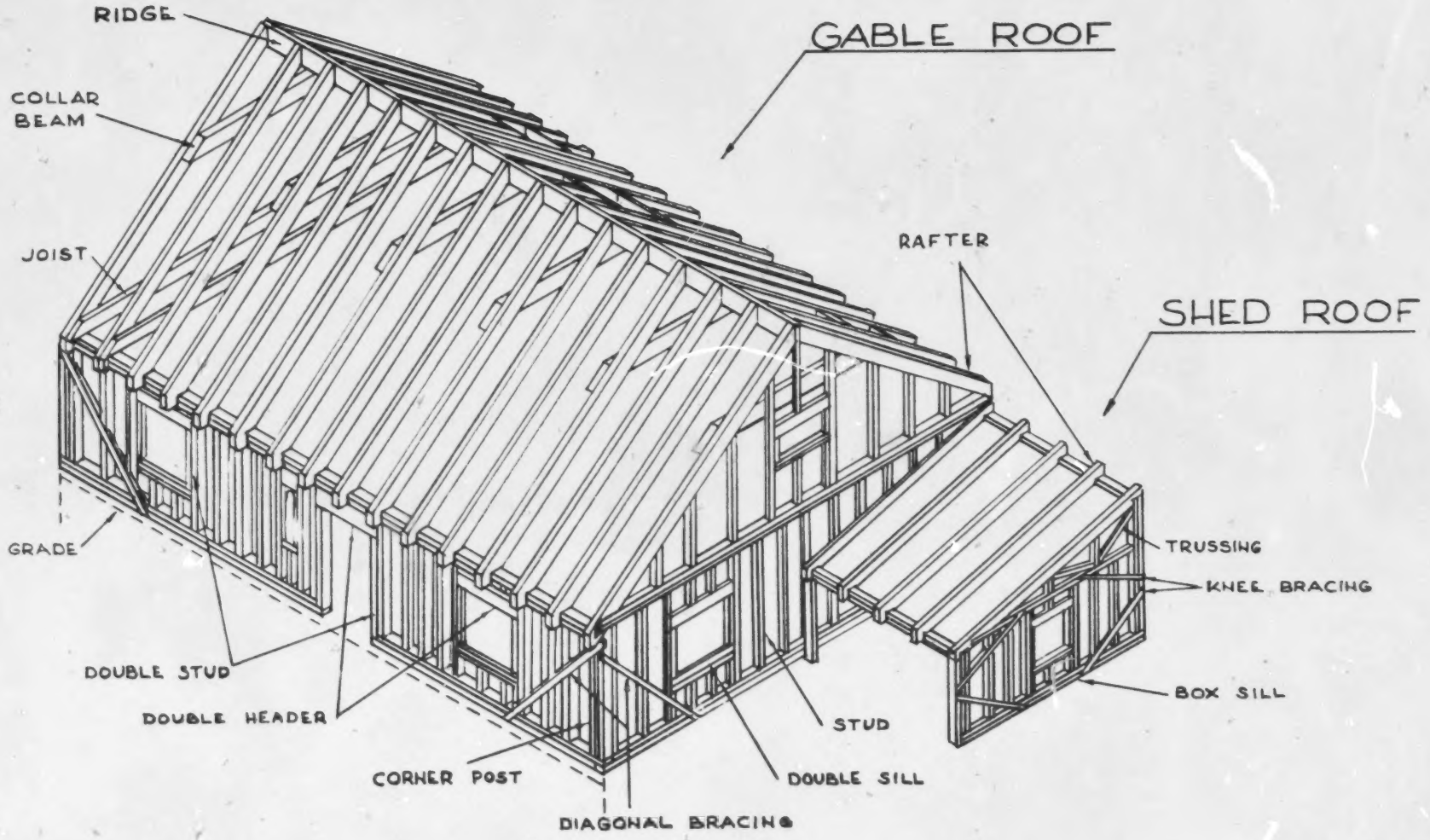
FRAMING



SOUTH ELEVATION
- FRONT -



EAST ELEVATION
- R. SIDE -

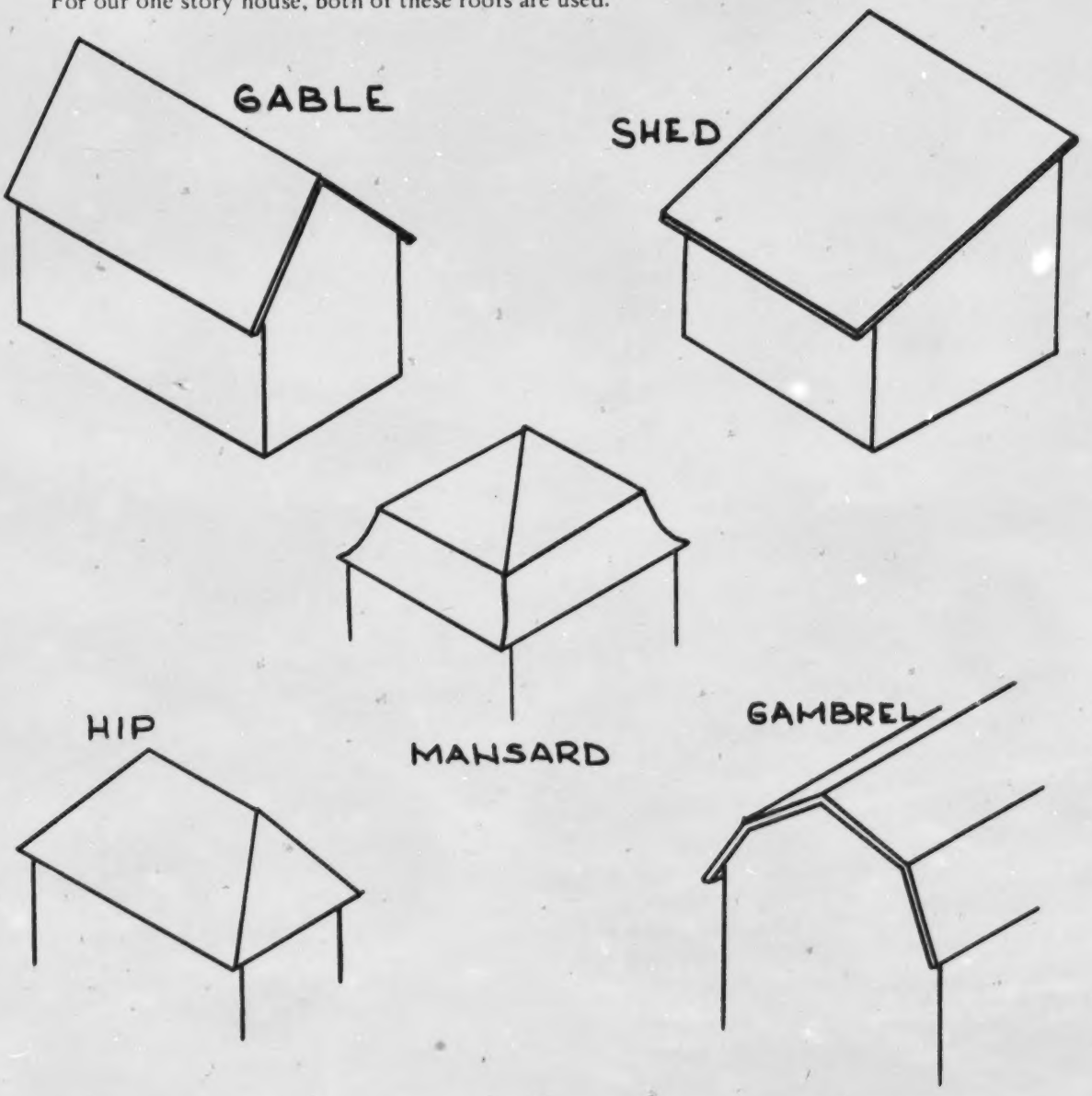

RIDGE
GABLE ROOF
COLLAR BEAM
JOIST
RAFTER
SHED ROOF
GRADE
TRUSSING
KNEE BRACING
DOUBLE STUD
DOUBLE HEADER
BOX SILL
STUD
CORNER POST
DOUBLE SILL
DIAGONAL BRACING

CORNER FRAMING

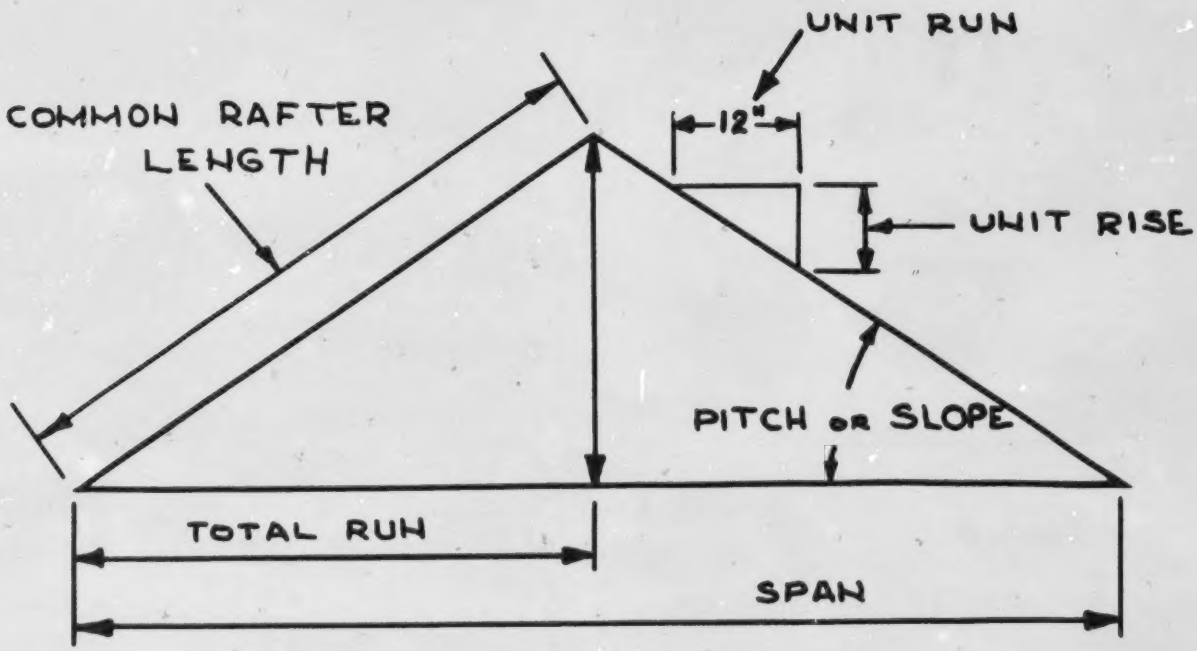
INFORMATION:

Common types of roofs are: shed, hip, gable, gambrel, and mansard.

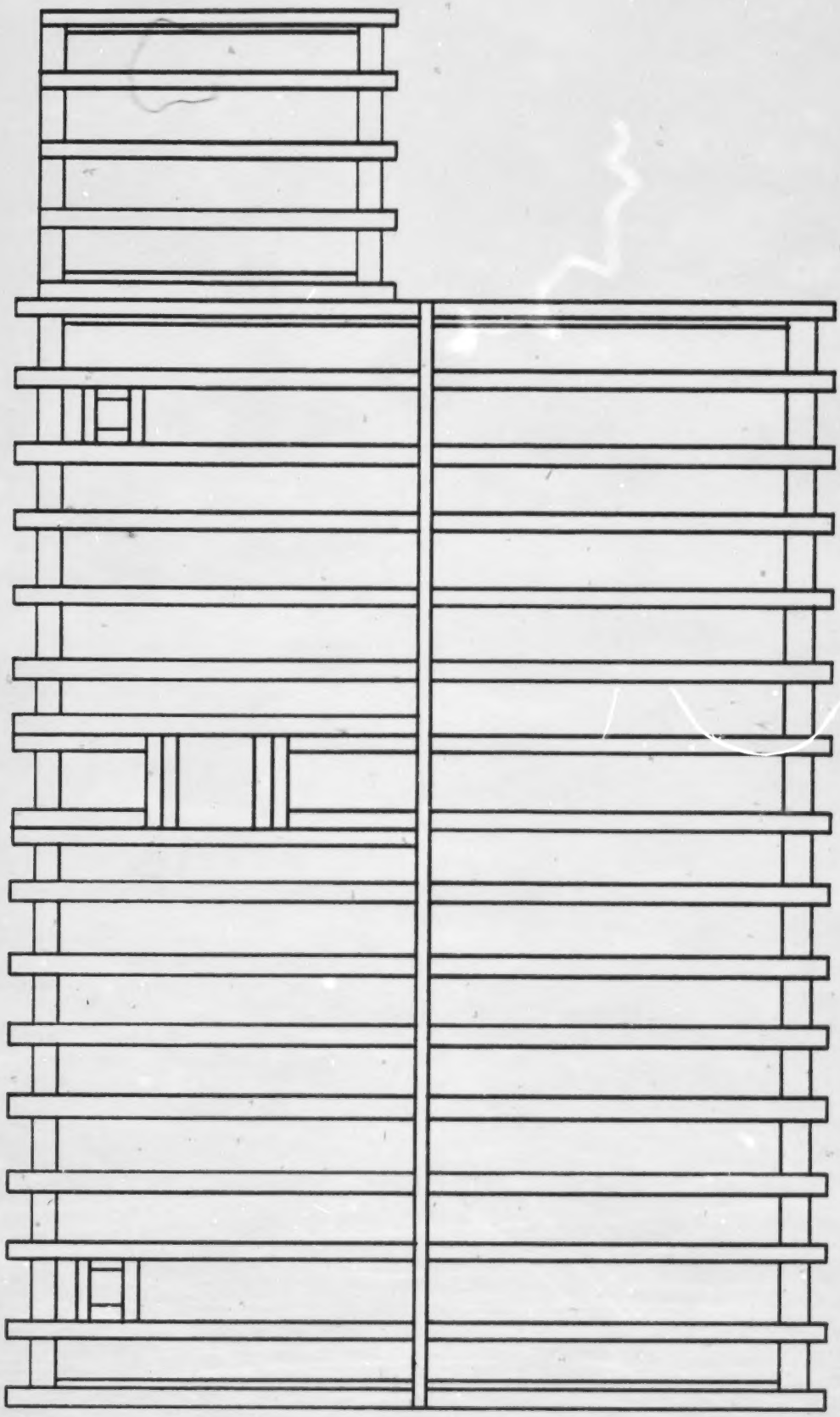
The Gable Roof is most commonly used for small houses because of its simplicity of design and low cost of construction. The Shed Roof is usually employed for small sheds, porches, garages and other buildings where appearance is not a matter of great importance. For our one story house, both of these roofs are used.



DEFINITIONS



ROOF FRAMING PLAN



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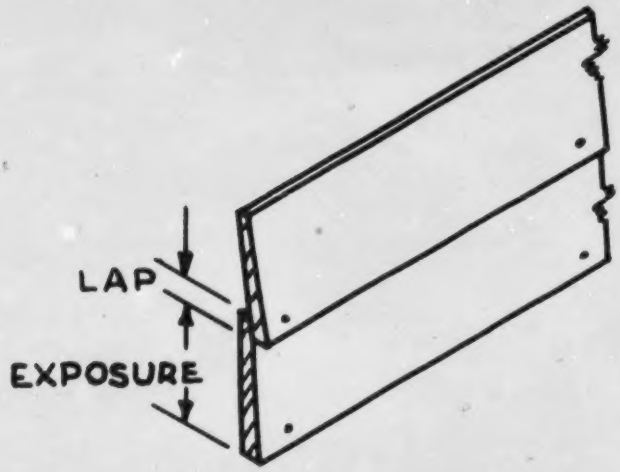
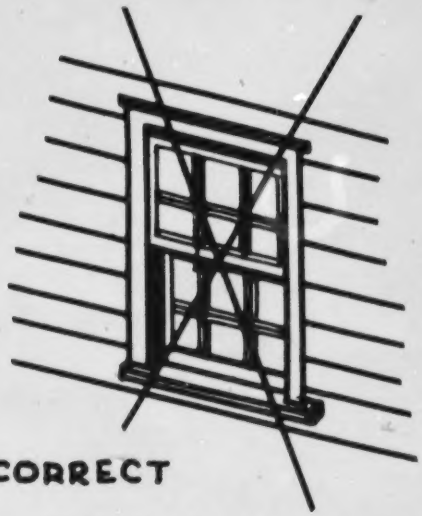
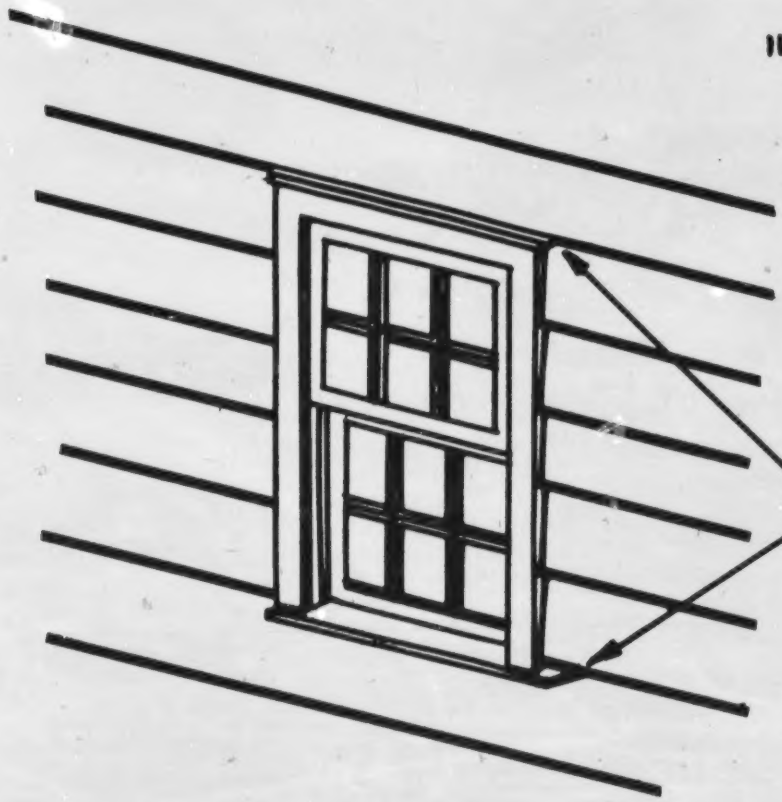
INFORMATION:

The selection of exterior covering on the wall has a great deal to do with overall appearance and maintenance of the house, so its selection should be made with care. Until recently the most usual exterior covering was wood siding.





INCORRECT

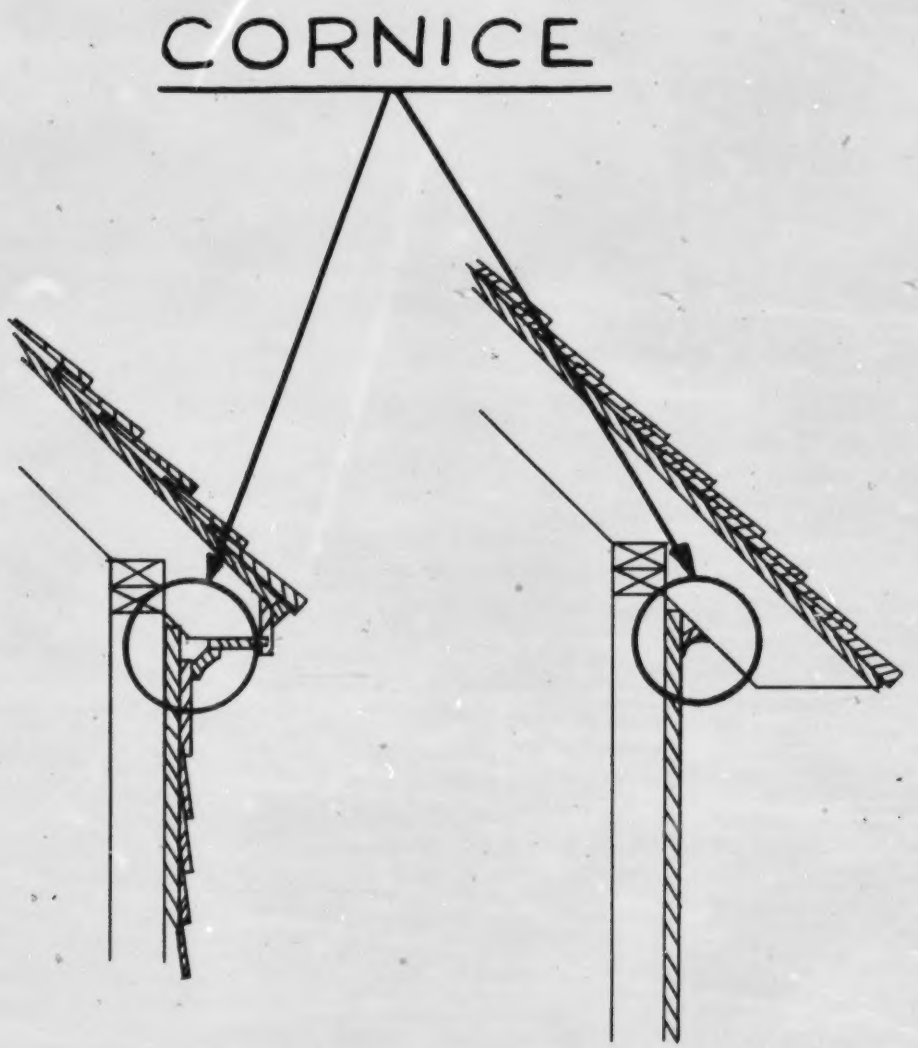


CORRECT METHOD OF APPLYING SIDING

INFORMATION:

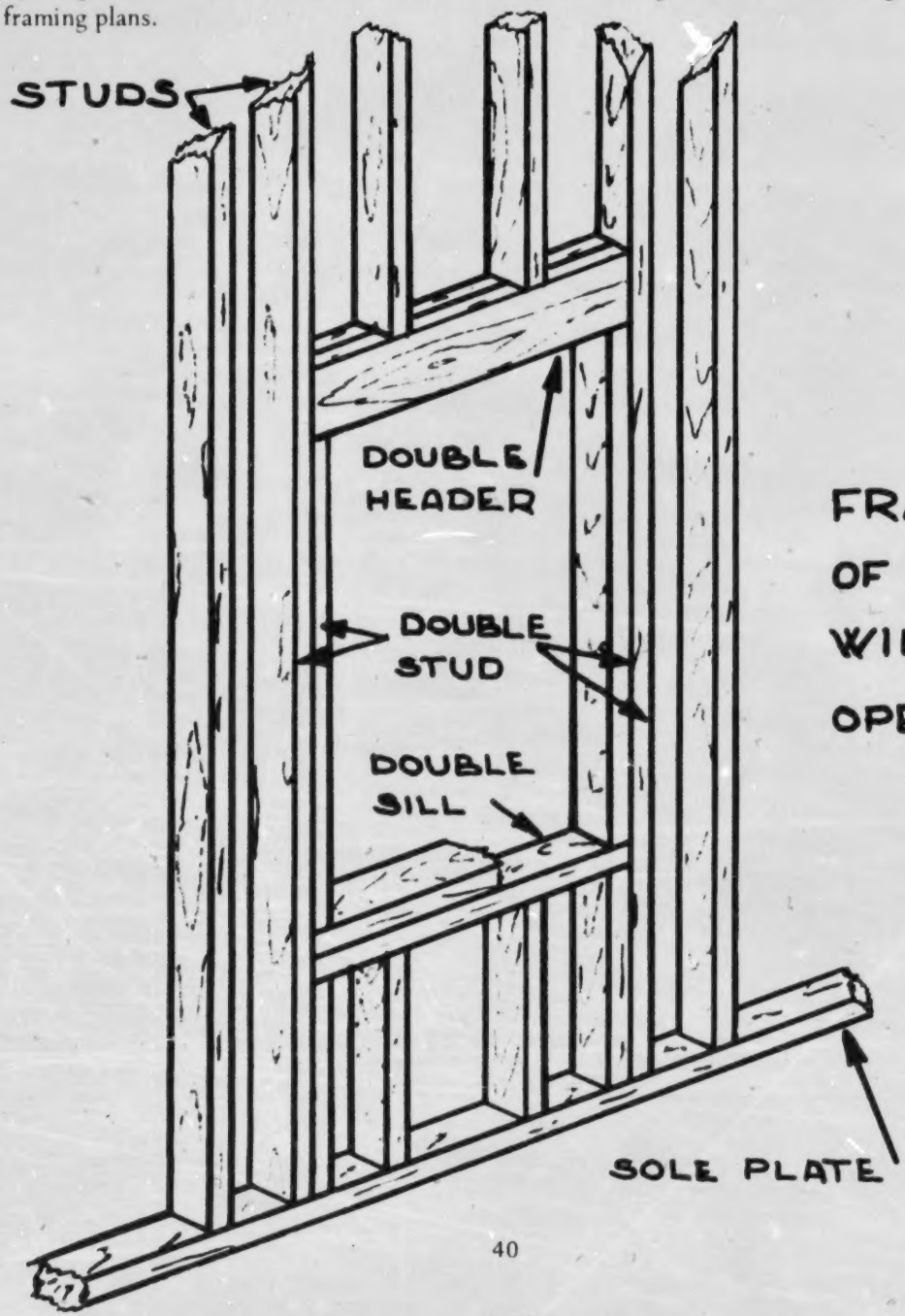
The cornice is the horizontal projection at the top of the exterior wall of a house where the sloping roof meets the vertical wall. There are various styles of cornice trim, but they may be divided into three commonly used styles: simple type, open cornice and boxed cornice.

Regardless of the type, the cornice trim should harmonize with the style of the house.



INFORMATION:

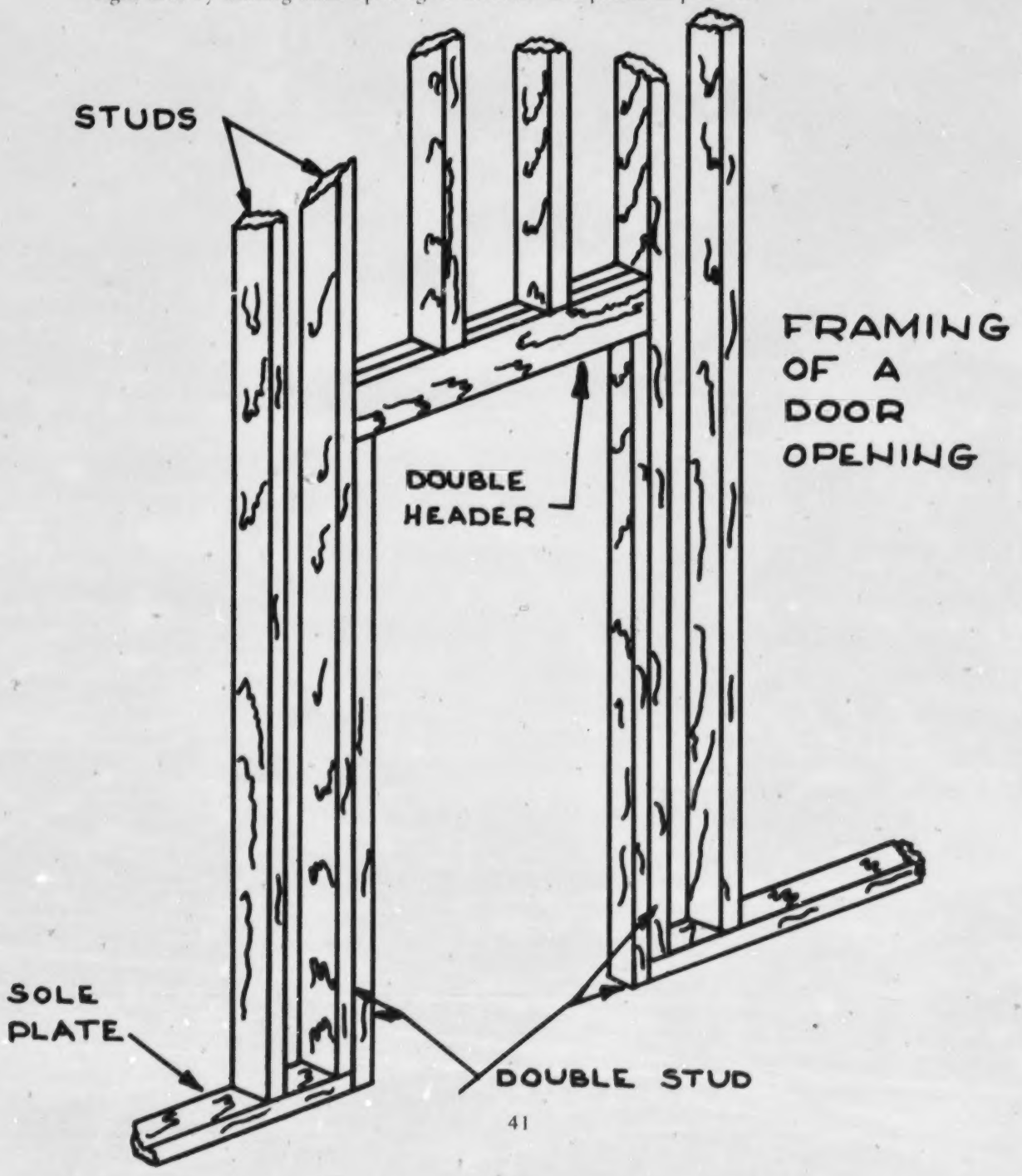
The two important points in setting the frames in the openings are to be sure that the frames are plumb and that there is no air space between the frame and the studding. The openings in the frame should be cut accurately according to the dimensions given in the framing plans.



FRAMING OF A WINDOW OPEHING

INFORMATION:

Framing around door openings is double. A carpenter can save himself a lot of work right here by making these openings as accurate and plumb as possible.



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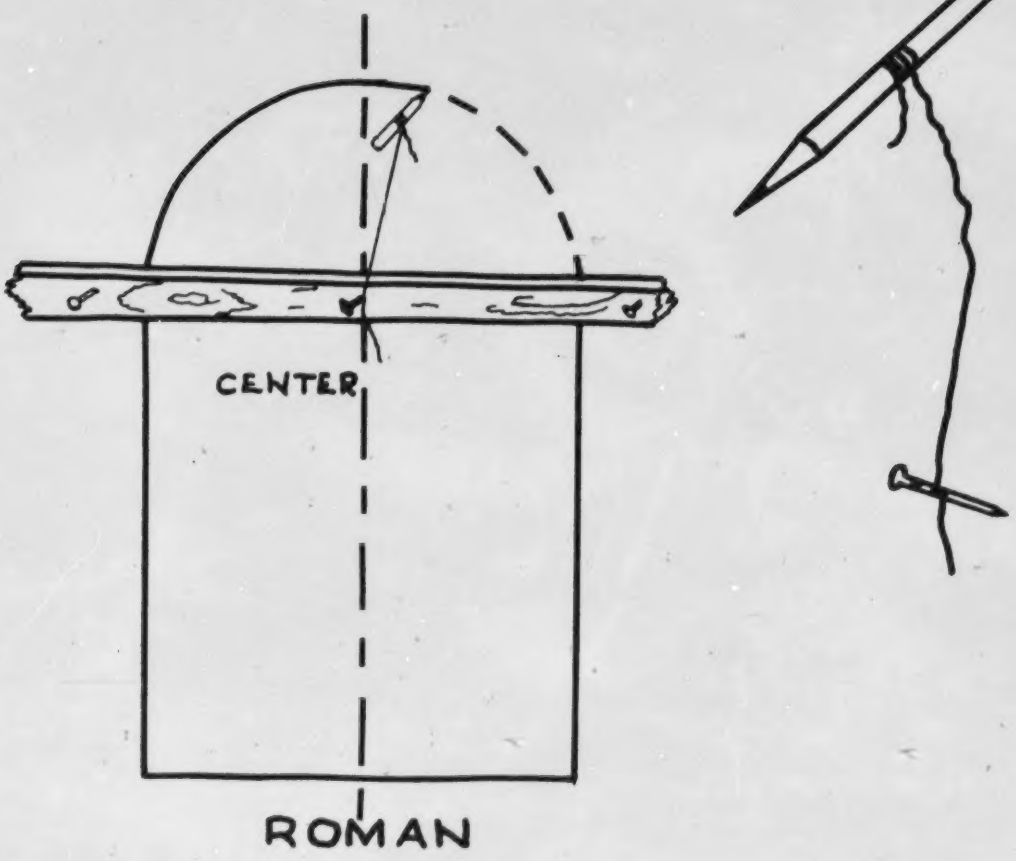
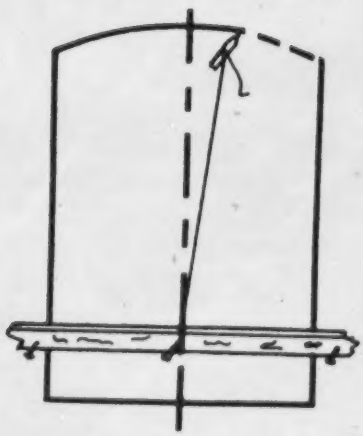
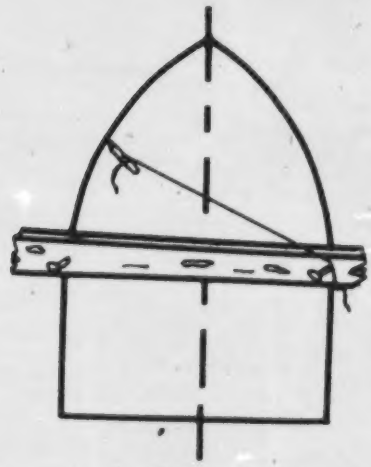
ARCHES



ROMAN



SEGMENTAL



GOTHIC

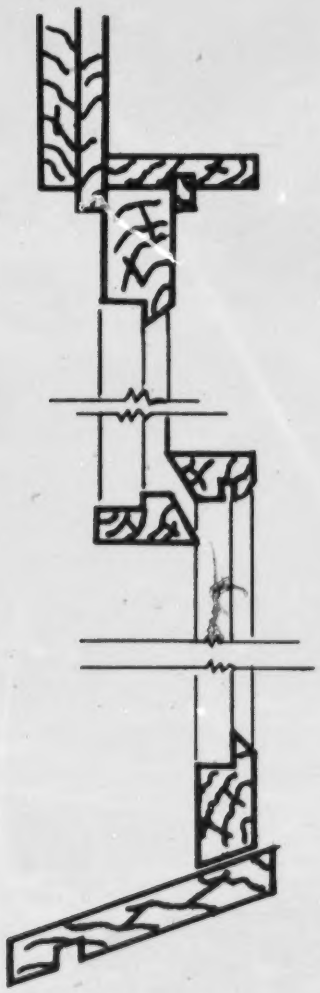
UNIT V - STRUCTURAL BUILDING DETAILS - INTERIOR

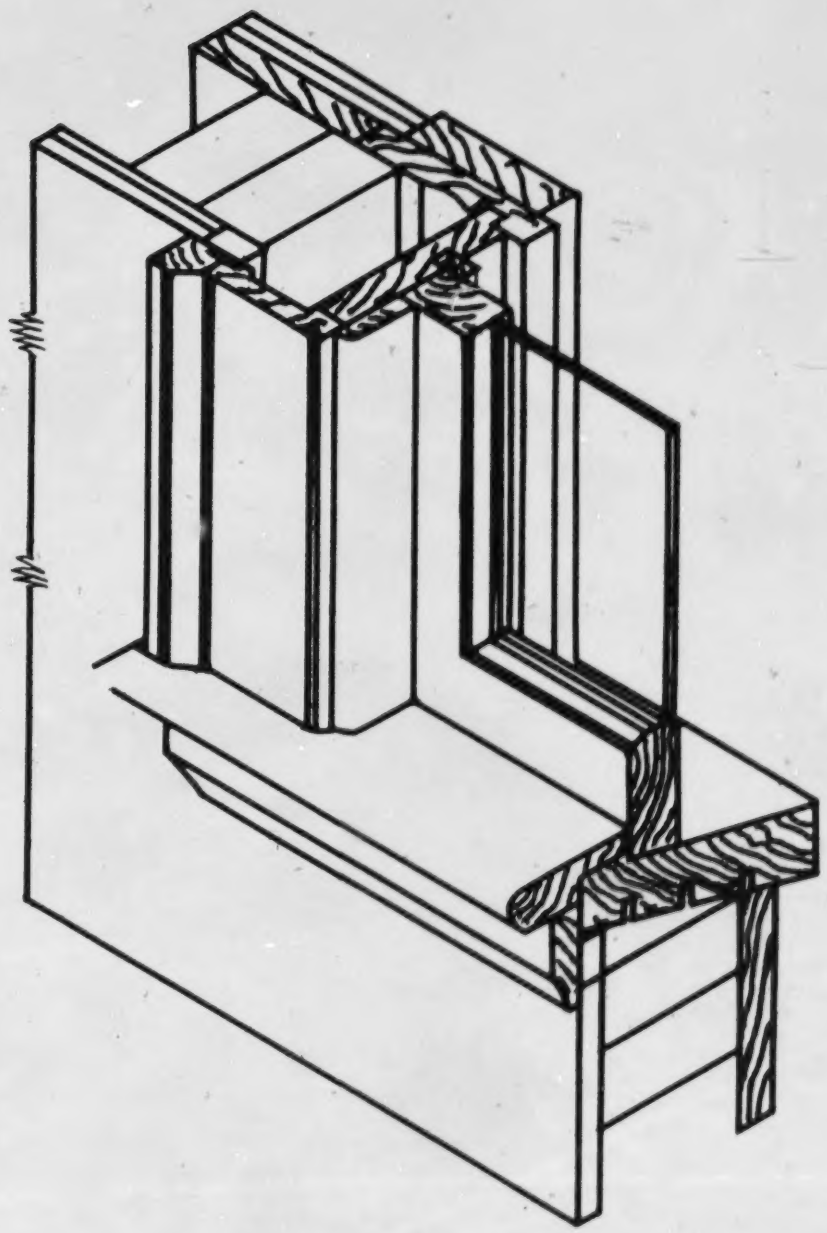
Lesson I — Window Sash

INFORMATION:

Windows are standardized items and are easily obtainable, but will vary in some parts of the country. Construction of windows is established to meet the requirements of house construction, as are the shapes, designs, and sizes.

DOUBLE-HUNG SASH





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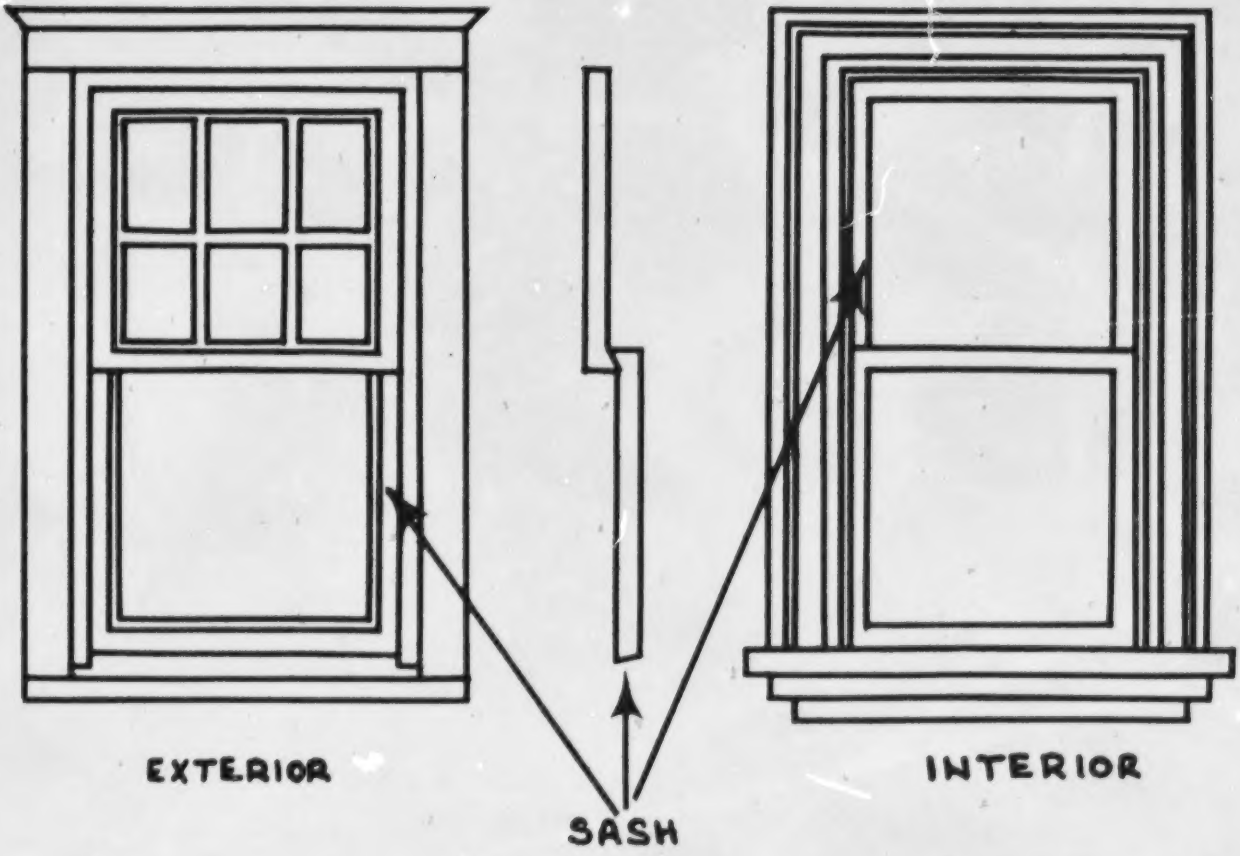
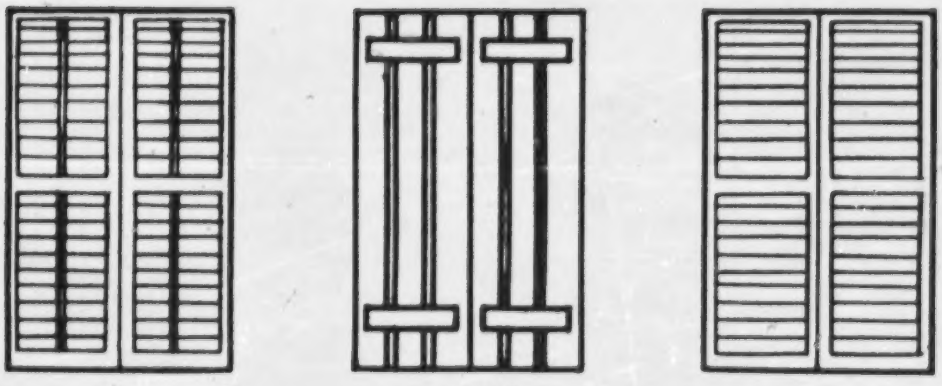
DETAIL OF WINDOW

WINDOWS



SHUTTERS



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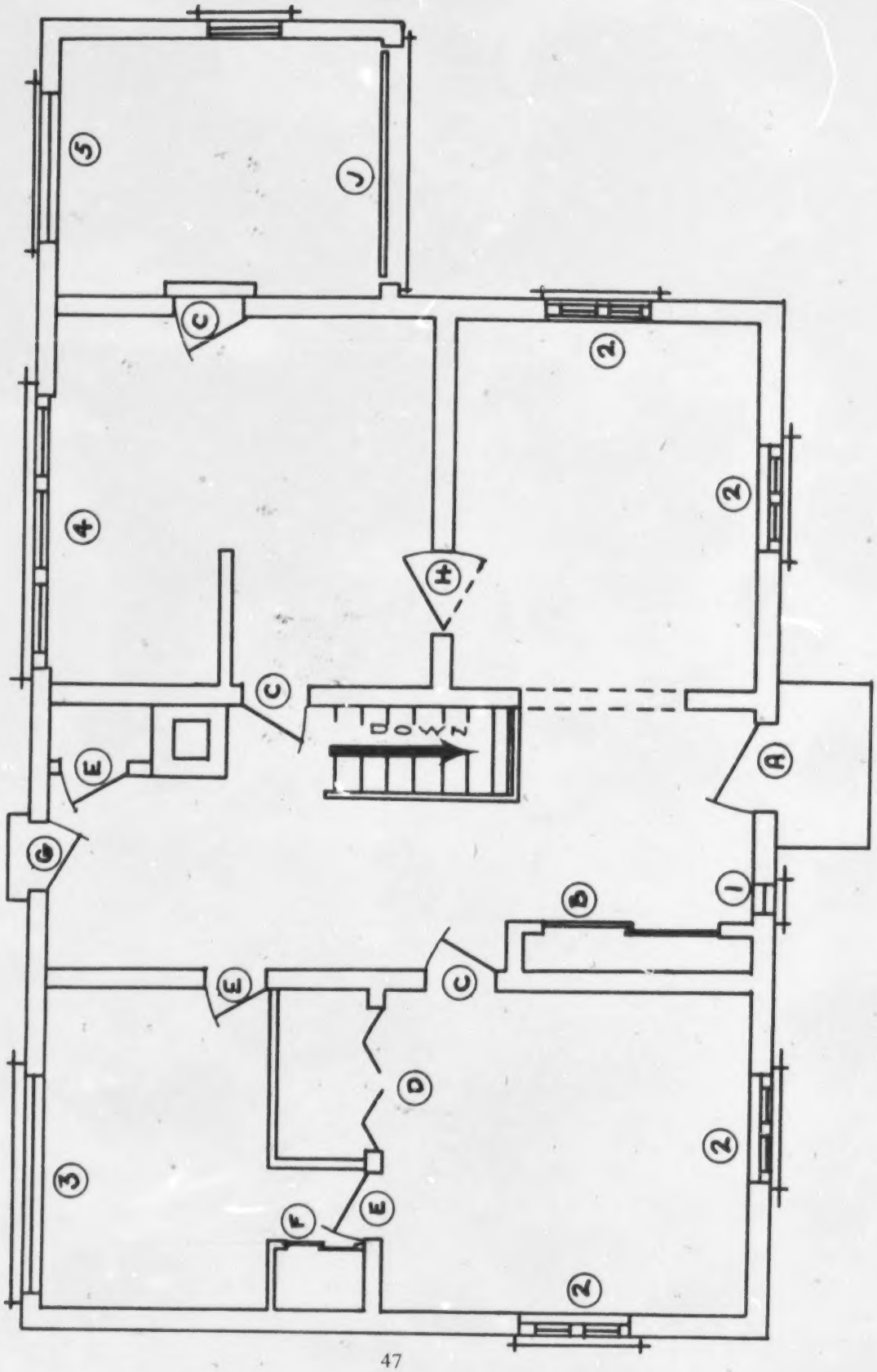
WINDOW SCHEDULE

TYPE	SIZE	REMARKS
1	1'-0" x 2'-6 3/8"	Fixed leaded sidelight
2	3'-5 3/4 x 2'-6 3/8"	Casement
3	2'-8" x 4'-11"	Andersen "Flexivent"
4	3-3'-0" x 2'-0"	Casement
5	8'-0" x 4'-2"	18 Lite fixed sash steel
6	2'-2" x 3'-2"	Double-hung

DOOR SCHEDULE

TYPE	SIZE	REMARKS
A	3'-0" x 6'-8" x 1 3/4"	Entrance Glamour 1 lite
B	2-2'-6" x 6'-8" x 1 3/8"	Flush slide door
C	3'-0" x 6'-8" x 1 3/8"	Flush door
D	4-2'-0" x 6'-8" x 1"	Bi-fold Louvre door
E	2'-8" x 6'-8" x 1 3/8"	Flush door
F	2-1'-6" x 6'-8" x 1 3/8"	Flush slide door
G	2'-8" x 6'-8" x 1 3/8"	2 Lite rear entrance door
H	2'-8" x 6'-8" x 1 3/8"	Double acting flush
J	8'-0" x 7'-0" x 1 3/8"	Overhead door 3 lite



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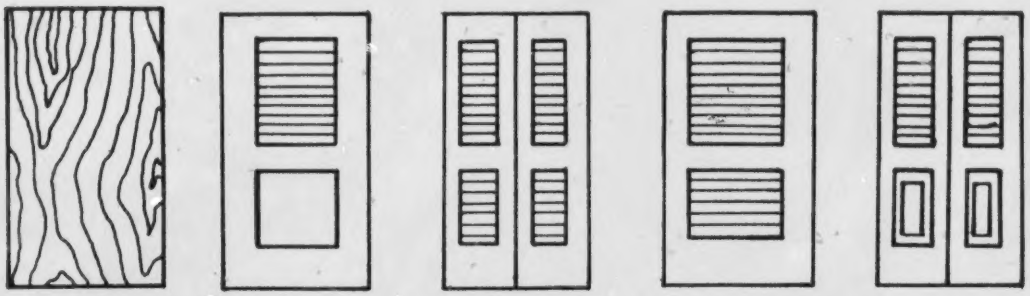
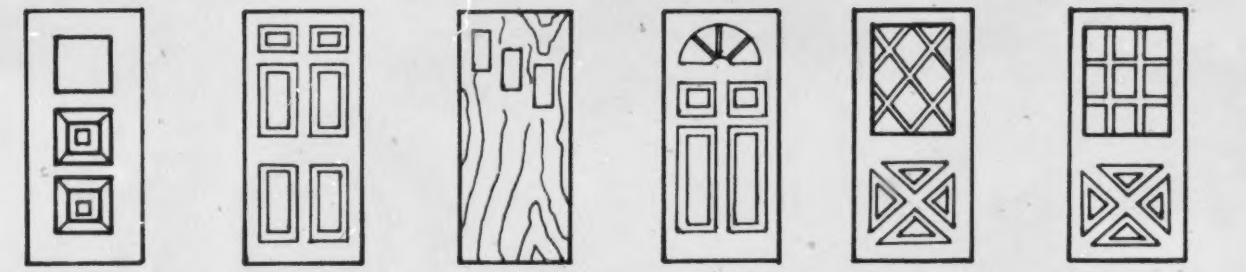
INFORMATION:

Doors are classified as to their use: exterior, interior, garage and others. The design of a door must go with the style of the house. The sizes of doors have been standardized.



INTERIOR DOORS



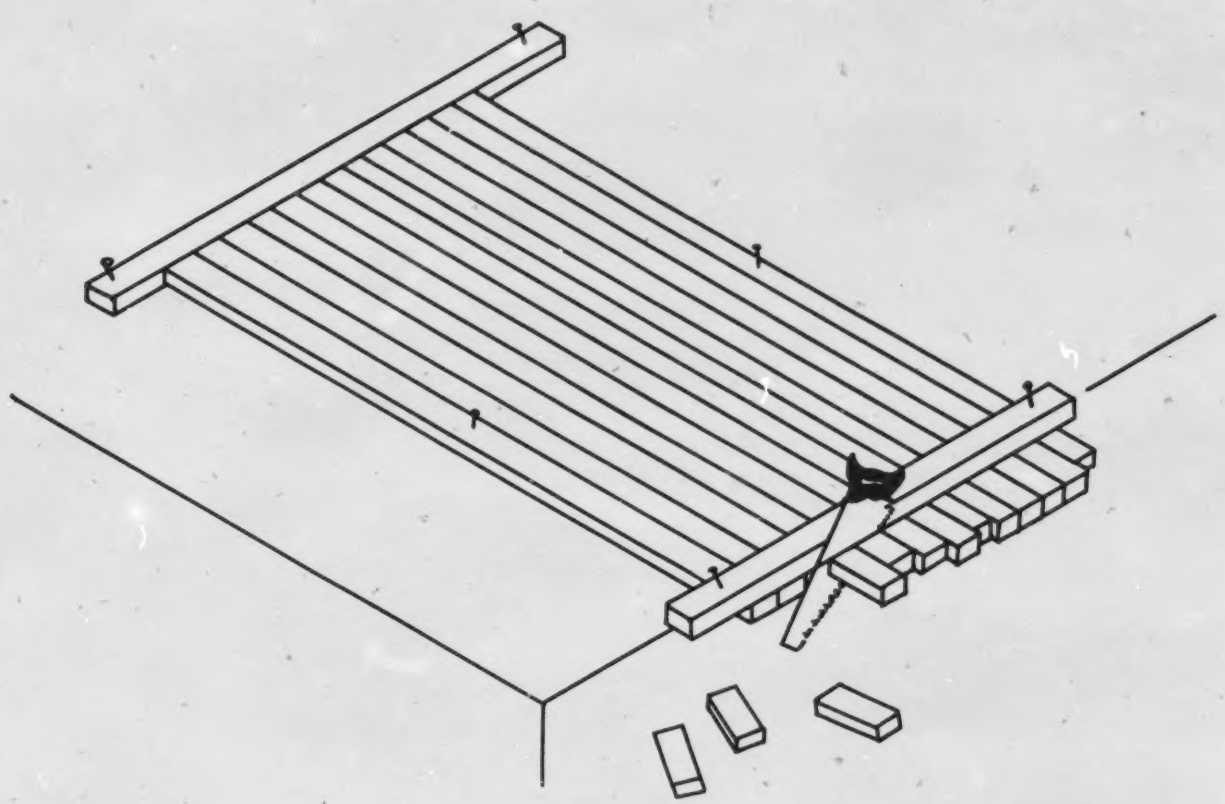
EXTERIOR DOORS

55

INFORMATION:

Outside walls should be plumb and permanently braced. Studding is spaced 16 inches on centers. Partitions consist of the same materials as are used for the outside walls, and studding in the partitions is spaced 16 inches on centers.

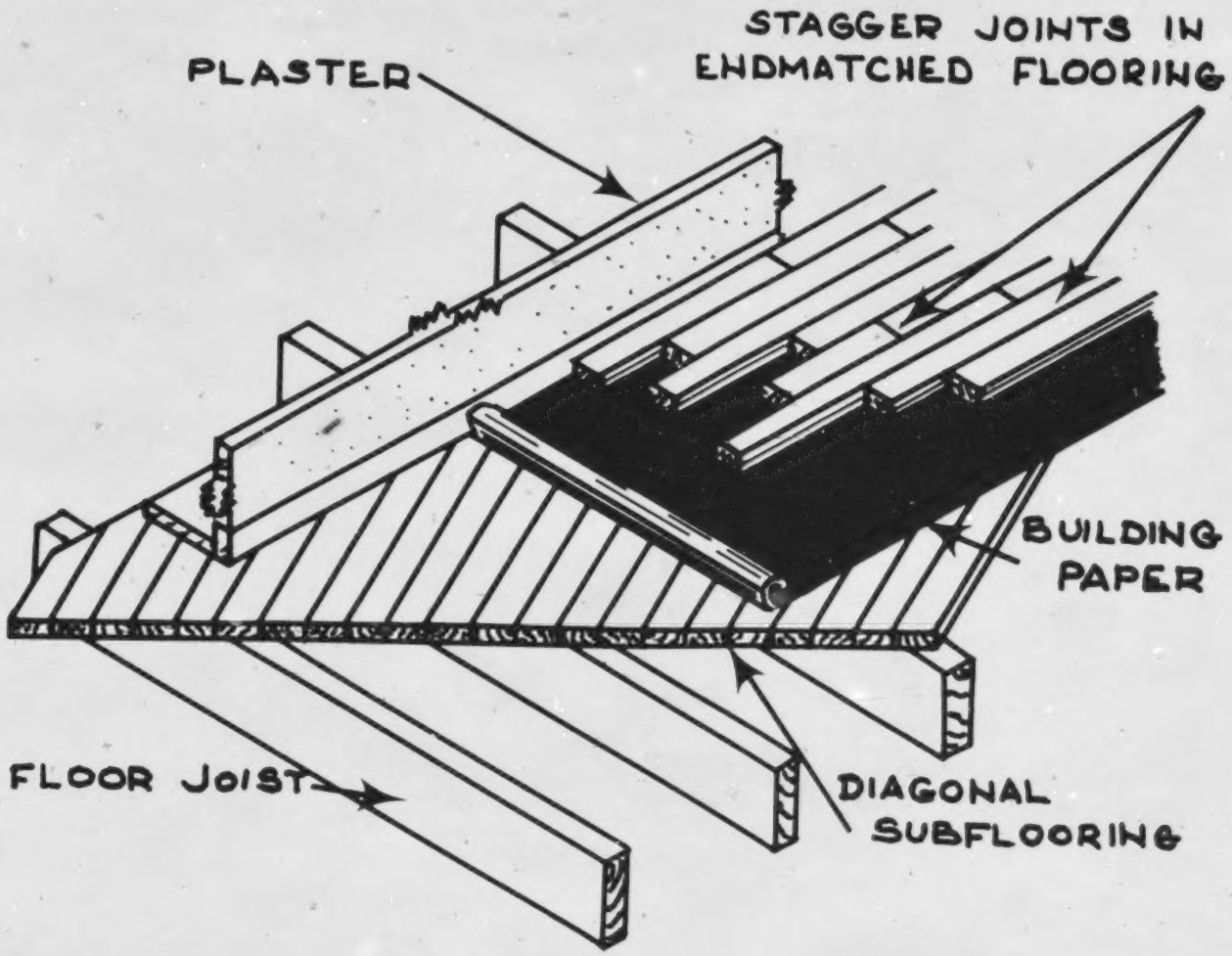
A SIMPLE JIG TO GET ALL WALL STUDS THE SAME LENGTH



INFORMATION:

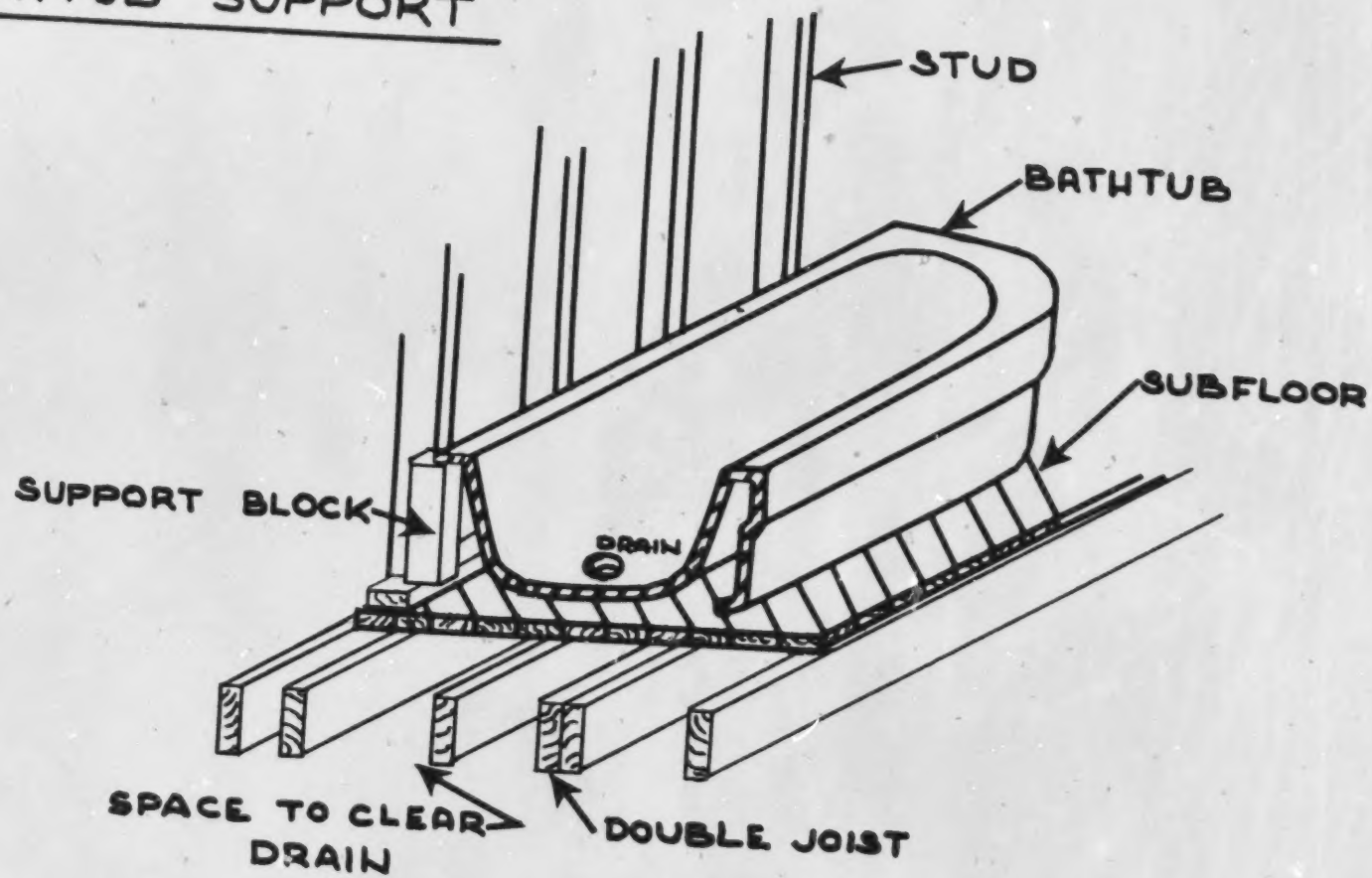
Because of the special requirements of the kitchen and bathroom, their floors are usually finished off in a somewhat different manner than those in the rest of the house.

The concrete-slab floor with ceramic, clay, or concrete tile or even flagstone will, of course, give a long wearing floor that is easily cleaned and very hard to damage.

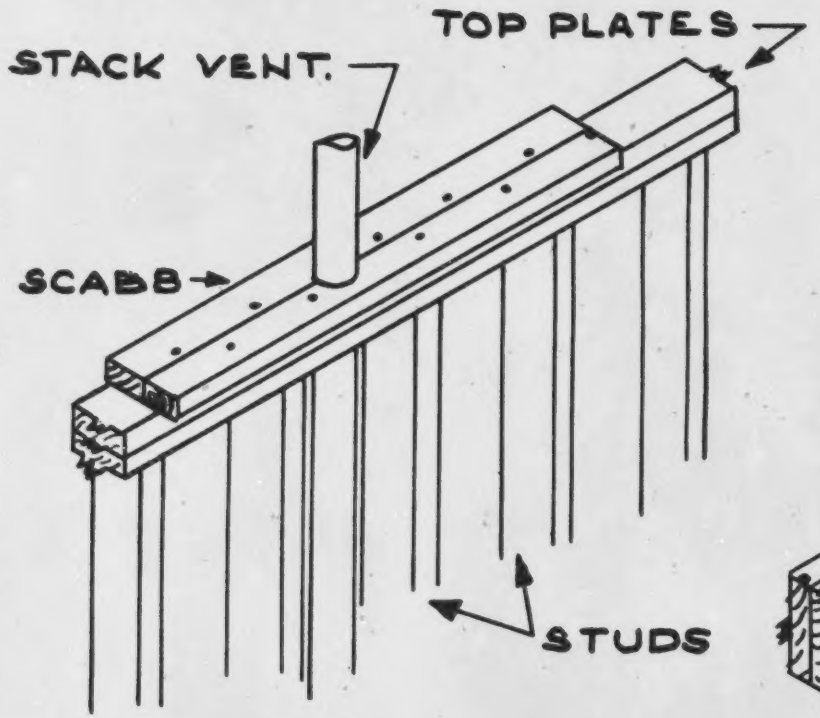


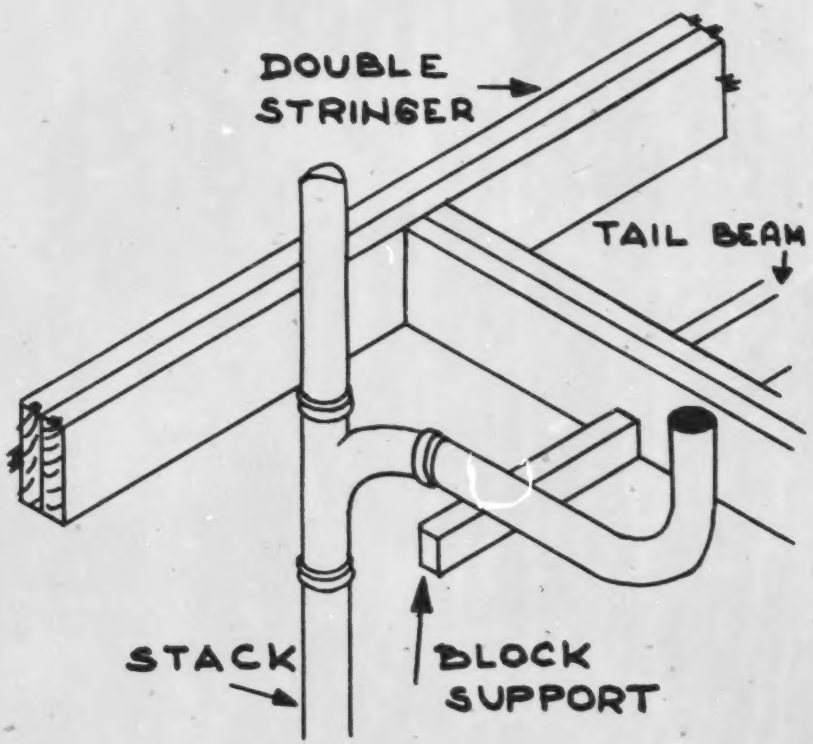
APPLICATION OF STRIP FLOORING

BATHTUB SUPPORT



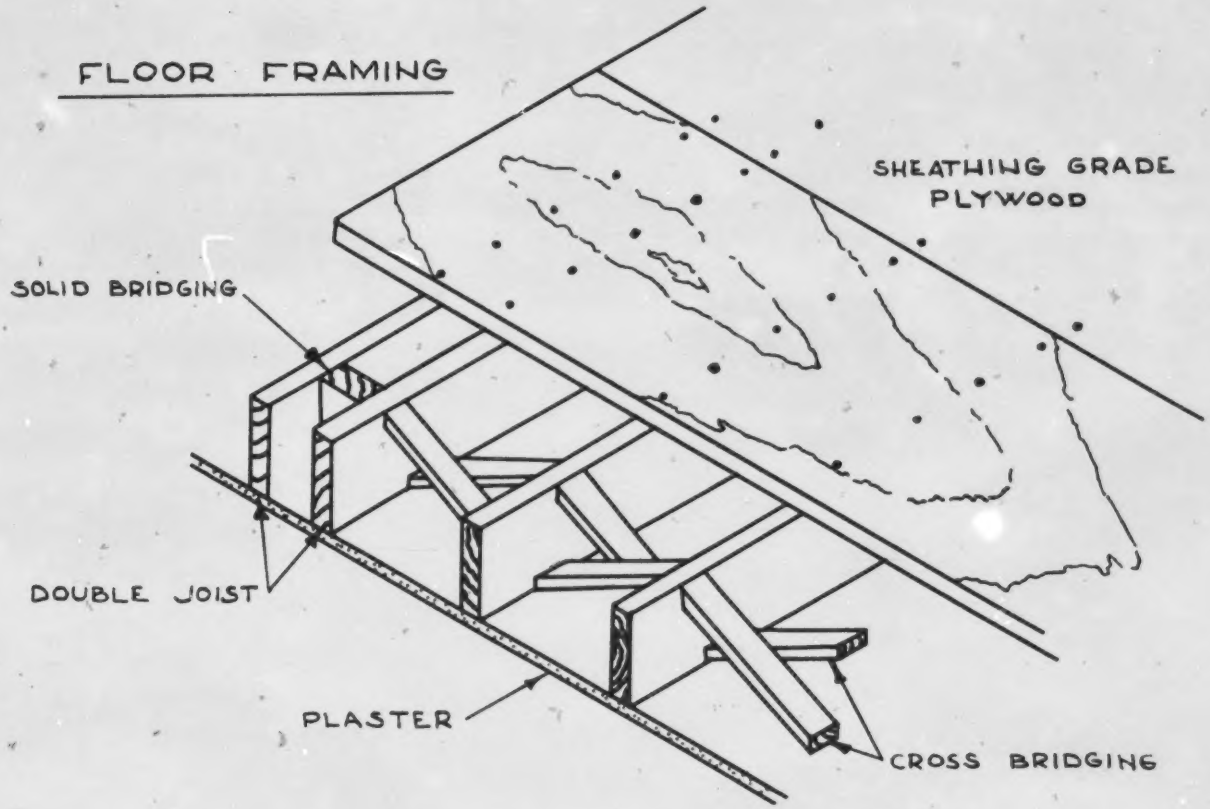
FRAMING DETAILS FOR PLUMBING





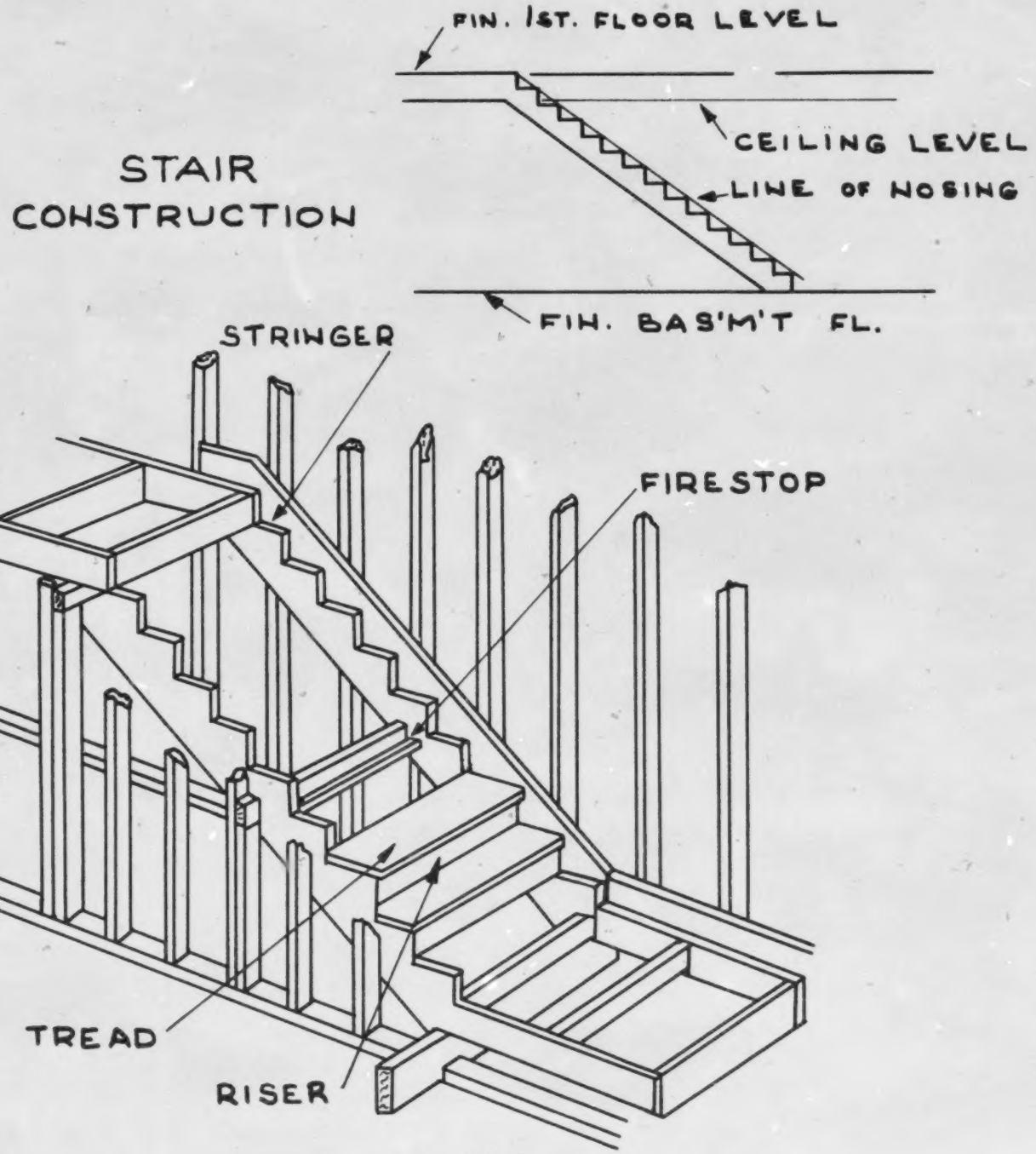
INFORMATION:

When it comes to covering the joists to make ceilings, there is a wide selection of materials to choose from. There are plywood, plaster board, composition board, insulating board, etc. These boards come in all sizes, ranging from the large building boards that measure 4 ft. by 12 ft. or more to the tiles that are only 1 ft. square, and these boards are, as a rule, very easy to work with.

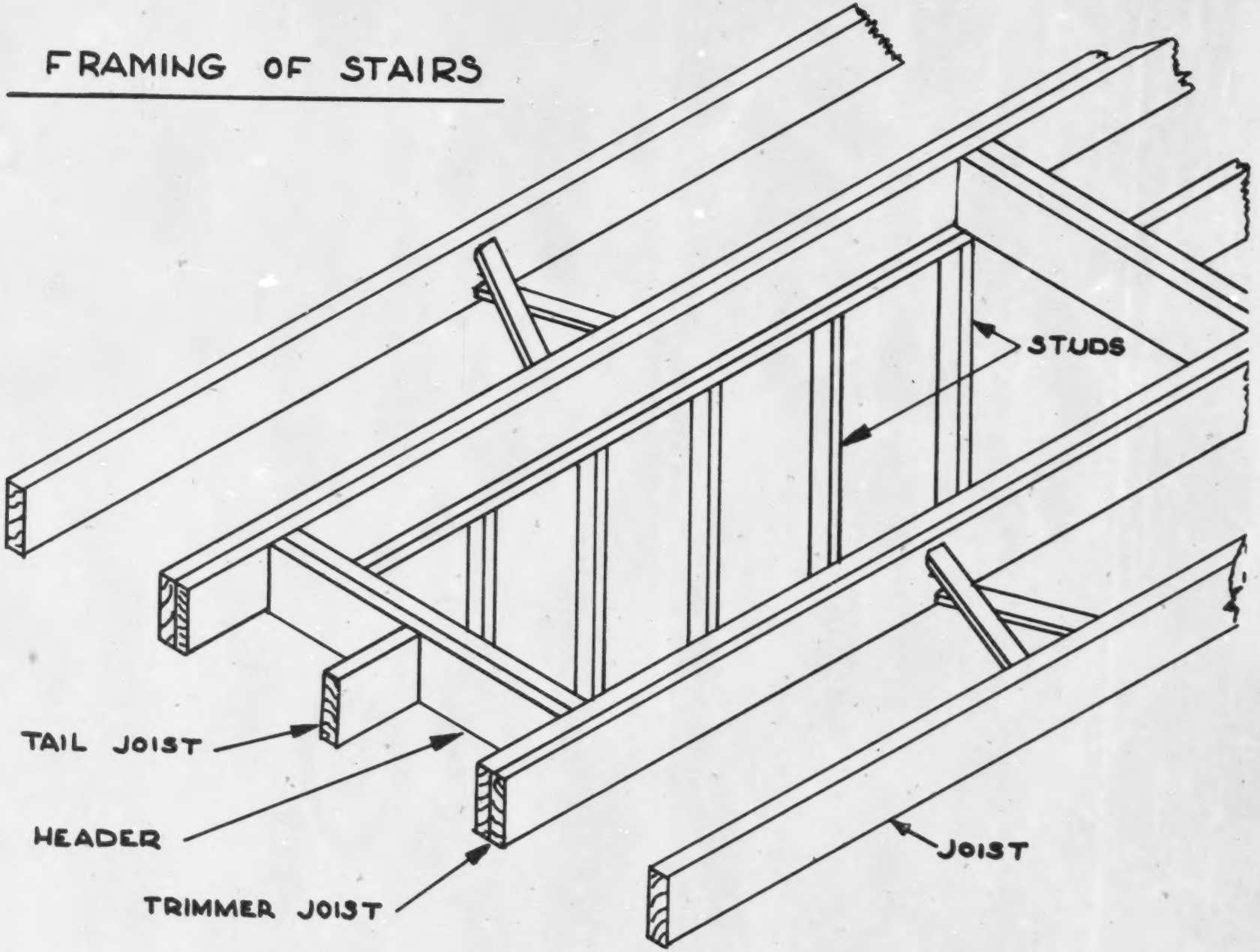


INFORMATION:

Stairs can either be purchased as ready-made stack stairs or the mill can make a set to meet individual requirements. Stairs to the attic and stairs to the basement can be constructed in the same fashion. The floor joists around the stair opening are doubled and at one side of the opening for basement stairs.



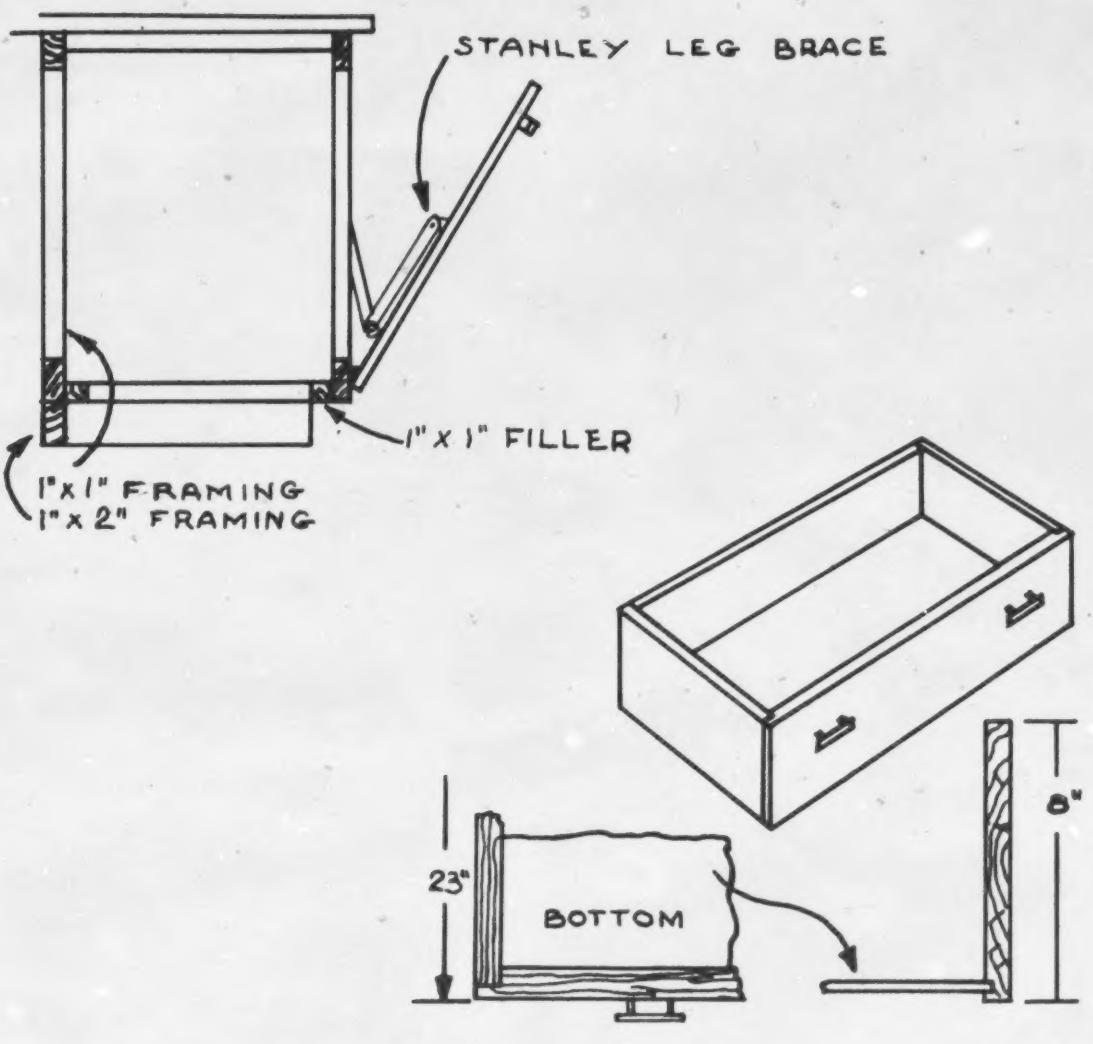
FRAMING OF STAIRS

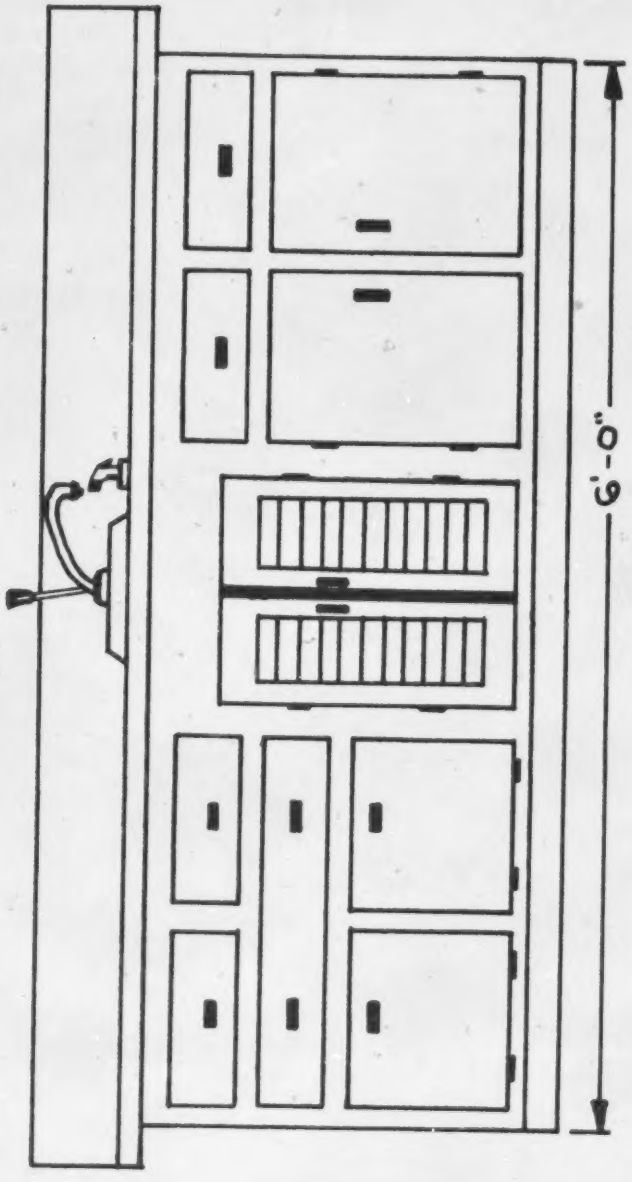


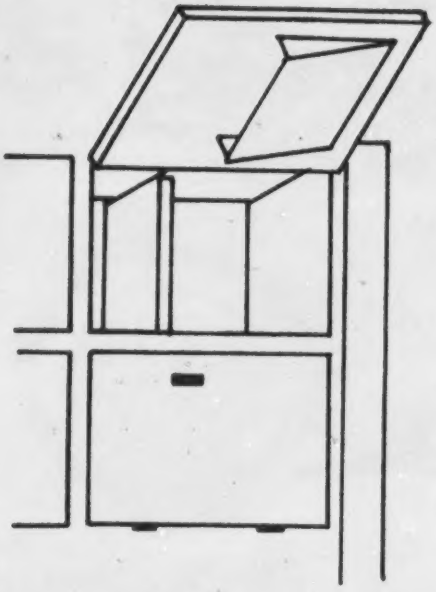
INFORMATION:

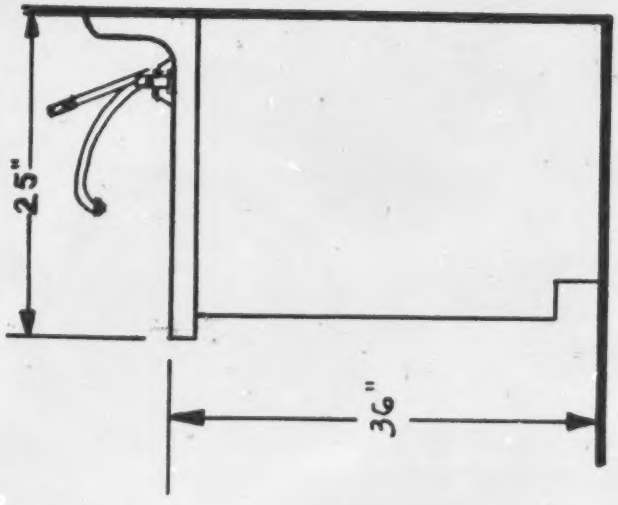
Modern ready-made kitchen equipment, such as ranges, worktables, and cabinets, are made to certain standards. The standards were arrived at after considerable research, and they will in spite of a few possible minor inconveniences, afford the maximum efficiency and comfort for the average person. Built-in furniture is ideal for small homes because it requires less space than ordinary furniture.

CONSTRUCTION OF CABINET




6'-0"




25"
36"

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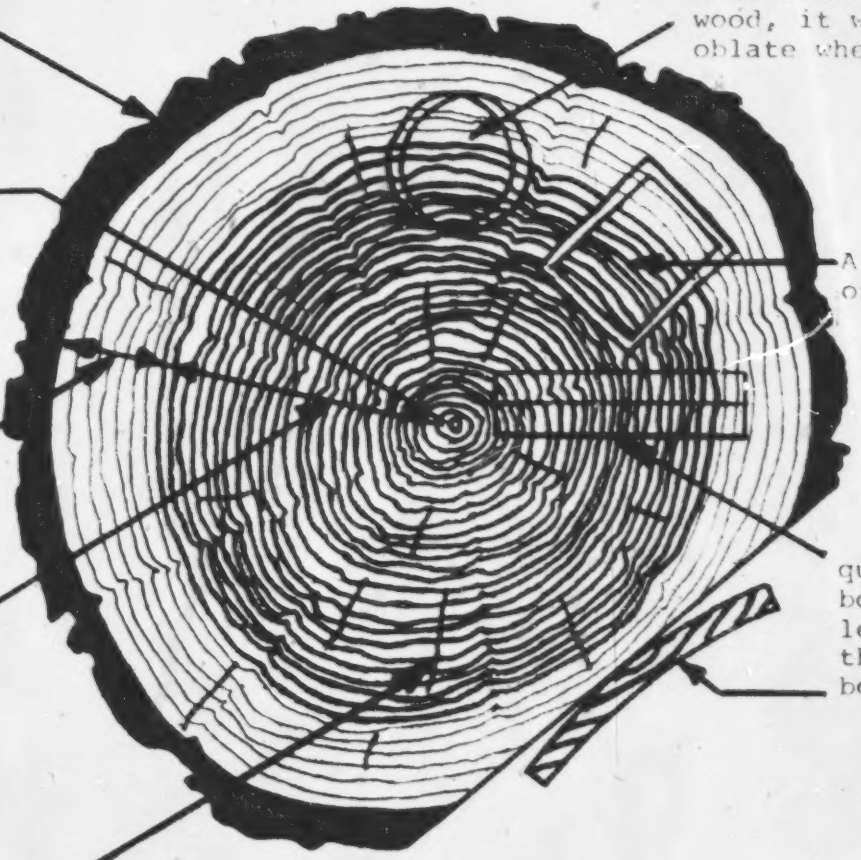
Walter E. Durbahn, Fundamentals of Carpentry, Volume II, 12th Edition, Chicago, 1960, American Technical Society.

Dahl and Wilson, Cabinet Making and Millwork, Chicago, 1962, American Technical Society.

APPENDICES

1. Cross section of tree trunk
2. Sawing of lumber
3. Common cuts in wood
4. Common wood joints
5. Nails
6. Wood screw table
7. American standard plumbing symbols

CROSS SECTION OF TREE TRUNK



CORK

PITH or HEART

SAPWOOD
Immature Wood

HEARTWOOD
Matured wood, constituting the major part of the trunks of old trees

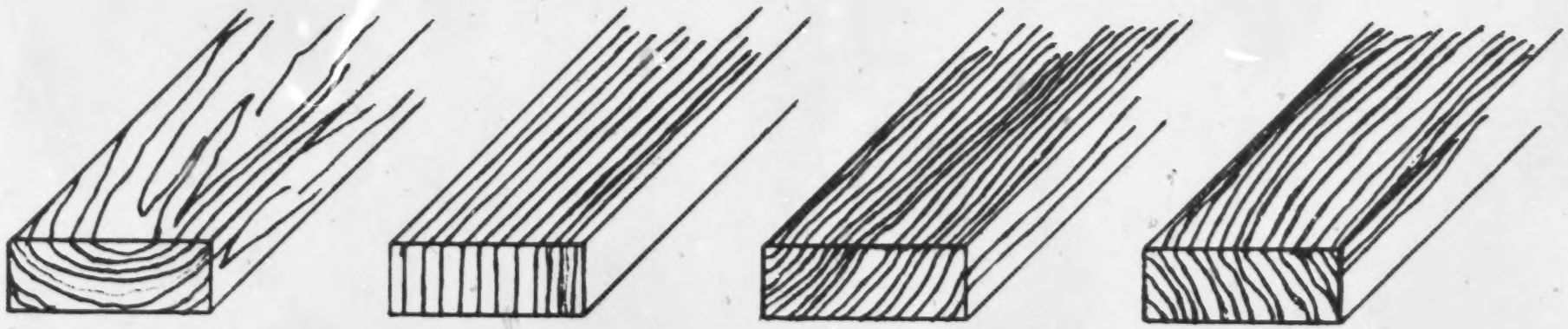
WOOD RAYS

If a true cylinder were cut from green wood, it would become oblate when seasoned

A square piece of wood

quarter-sawed boards shrink less than plane-sawed boards

SAWING OF LUMBER

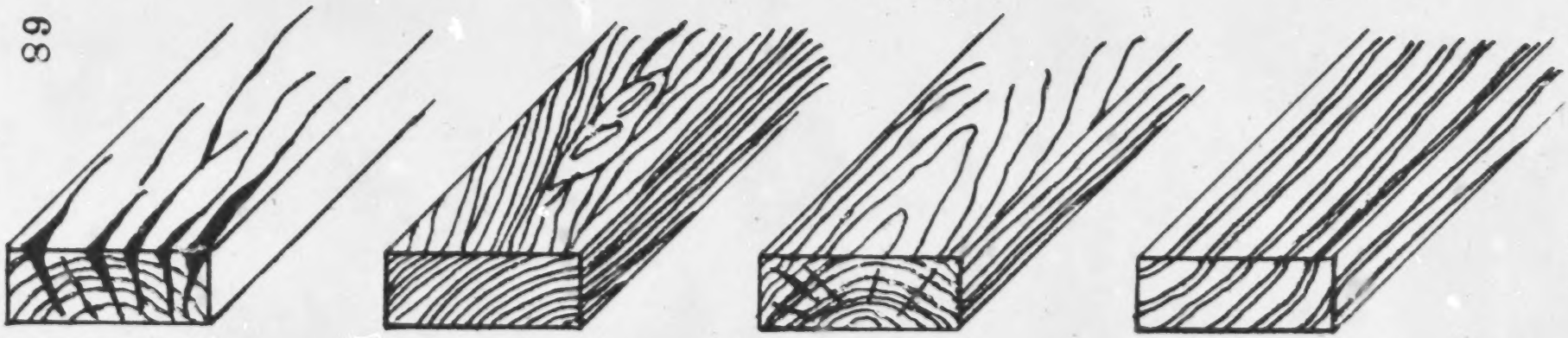


PLAIN SAWED
INNER

RADIAL
SAWED

TANGENTIAL
SAWED

QUARTER TANGENTIAL
SAWED



CHECKS

SHAKE

WARP

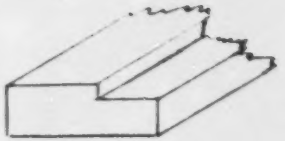
TANGENTIAL
SAWED

COMMON CUTS IN WOOD

BEVEL

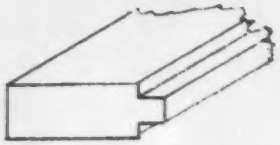
CHAMFER

STOP CHAMFER

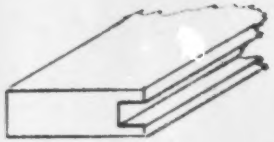


RABBET

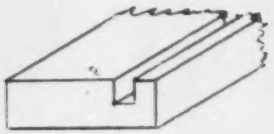
NOSING



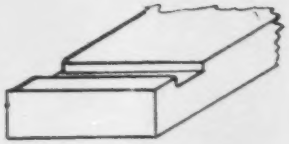
TONGUE



GROOVE

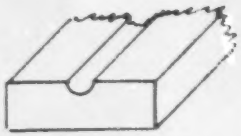


PLOW

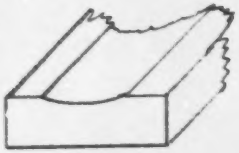


DADO

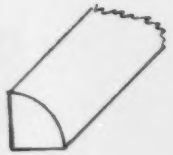
REED



FLUTE

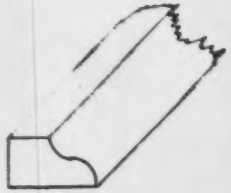


HOLLOW



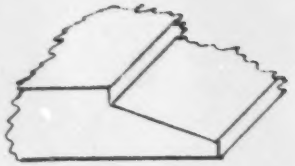
$\frac{1}{4}$ ROUND

COVE

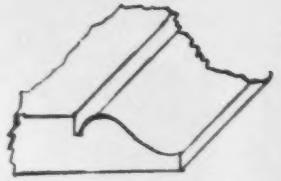


REVERSE OGEE

ROMAN OGEE

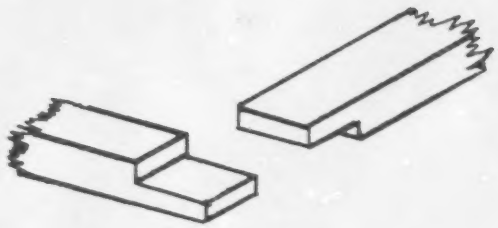


SHIP LAP

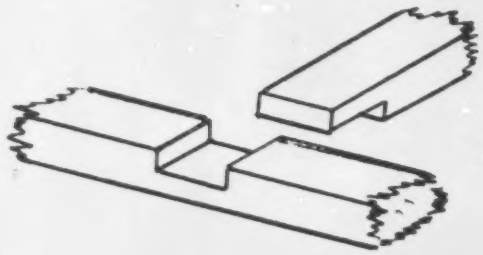


COMMON OGEE

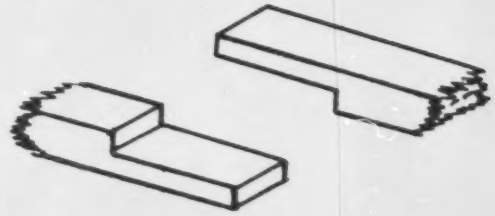
COMMON WOOD JOINTS



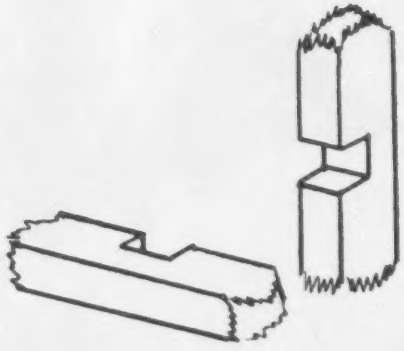
END LAP



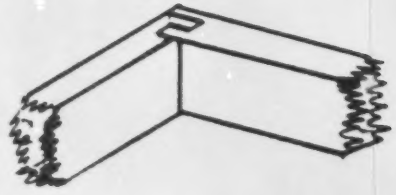
MIDDLE LAP



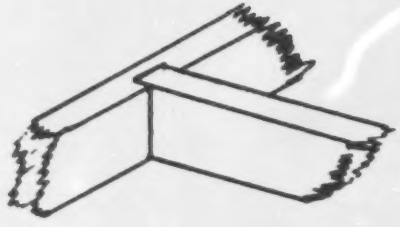
HALF LAP



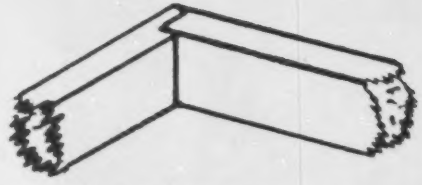
CROSS LAP



DADO TONGUE & RABBET

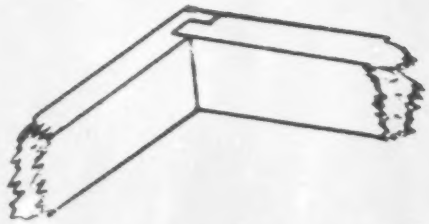


DADO

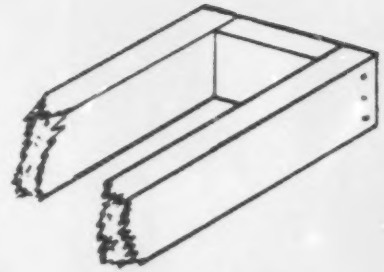


RABBET

70 63

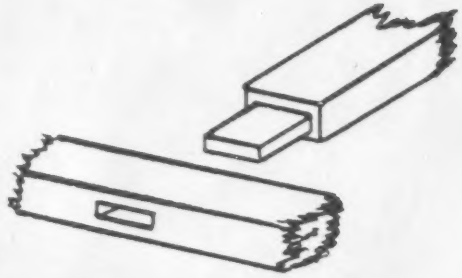


DADO & RABBET

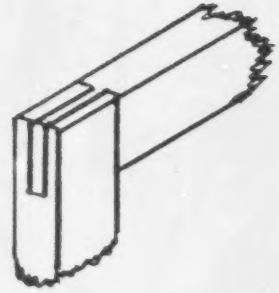


BUTT

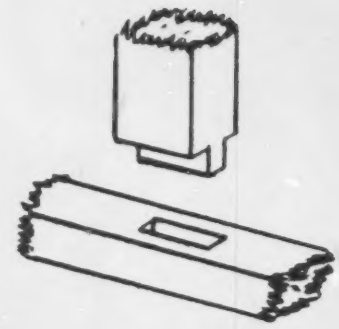
MITRE



THRU
MORTISE TENON

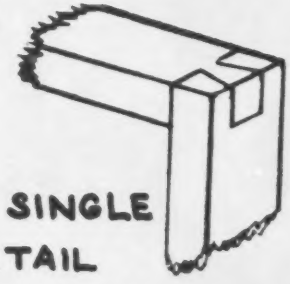


OPEN
MORTISE TENON

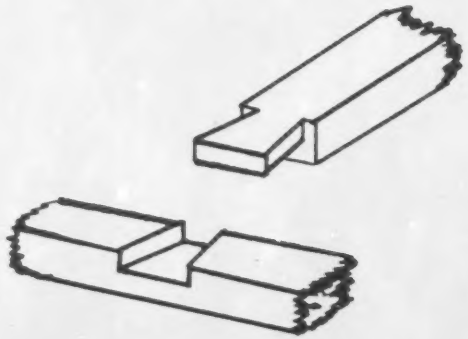


STUB

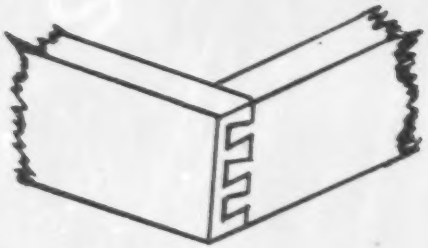
DOVETAIL
DADO



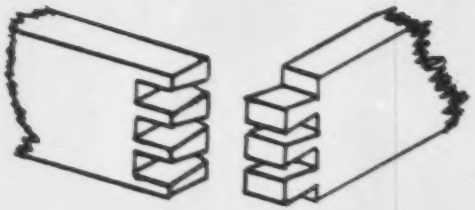
THRU SINGLE
DOVE TAIL



LAP DOVETAIL



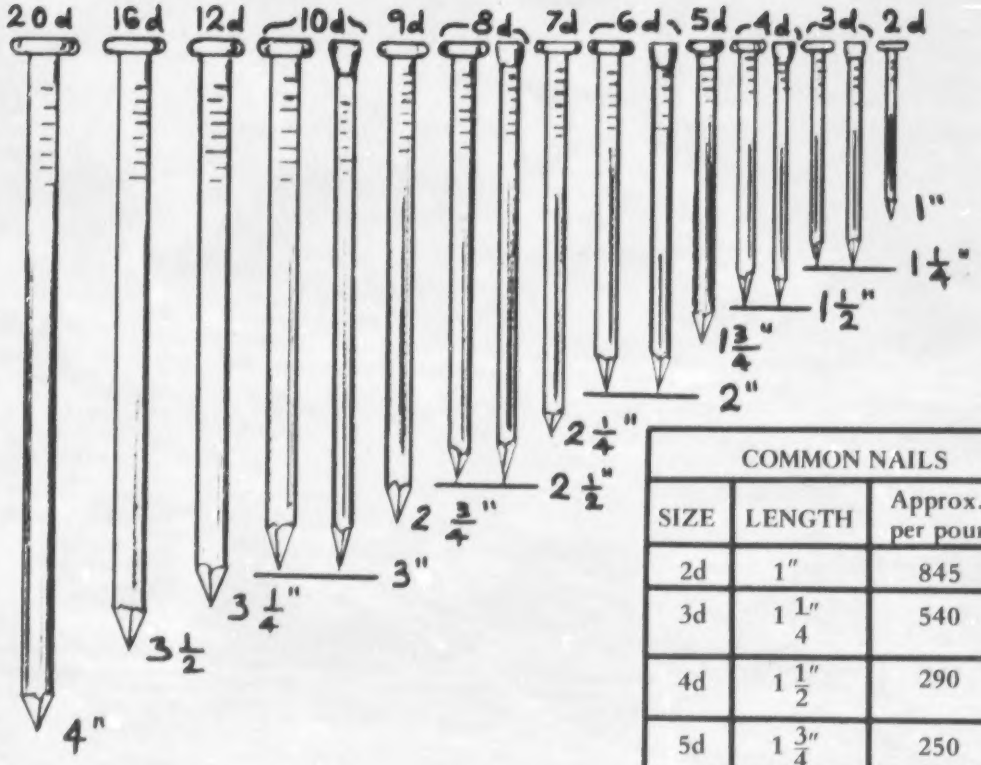
LAP DOVETAIL OR
HALF BLIND DOVETAIL



THRU MULTIPLE
DOVETAIL

NAILS

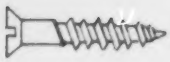
COMMON FINISHING



COMMON NAILS		
SIZE	LENGTH	Approx. No. per pound
2d	1"	845
3d	1 1/4"	540
4d	1 1/2"	290
5d	1 3/4"	250
6d	2"	165
7d	2 1/4"	150
8d	2 1/2"	100
9d	2 3/4"	90
10d	3"	65
12d	3 1/4"	60
16d	3 1/2"	45
20 d	4"	30

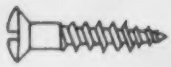
FINISHING NAILS		
3d	1 1/4"	880
4d	1 1/2"	630
6d	2"	290
8d	2 1/2"	195
10d	3"	125

WOOD SCREW TABLE



FLAT

ROUND

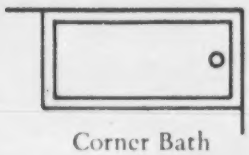


OVAL

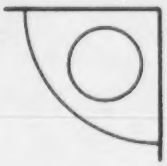
Length	Gauge		Gauge No.	Actual Dec.	Size Fract.
	Steel	Brass			
$\frac{1}{4}$	0- 4	0- 4	0	.060	$\frac{1}{16}$
$\frac{3}{8}$	0- 8	0- 6	1	.073	$\frac{5}{64}$ -
$\frac{1}{2}$	1-10	1- 8	2	.086	$\frac{5}{64}$ +
$\frac{5}{8}$	2-12	2-10	3	.099	$\frac{3}{32}$
$\frac{3}{4}$	2-14	2-12	4	.112	$\frac{7}{64}$
$\frac{7}{8}$	3-14	4-12	5	.125	$\frac{1}{8}$
1	3-16	4-14	6	.138	$\frac{9}{64}$
$1\frac{1}{4}$	4-18	6-14	7	.151	$\frac{5}{32}$ -
$1\frac{1}{2}$	4-20	6-14	8	.164	$\frac{5}{32}$ +
$1\frac{3}{4}$	6-20	8-14	9	.177	$\frac{11}{64}$
2	6-20	8-18	10	.190	$\frac{3}{16}$
$2\frac{1}{4}$	6-20	10-18	11	.203	$\frac{13}{64}$
$2\frac{1}{2}$	6-20	10-18	12	.216	$\frac{7}{32}$
$2\frac{3}{4}$	8-20	8-20	14	.242	$\frac{15}{64}$
3	8-24	12-18	16	.268	$\frac{17}{64}$
$3\frac{1}{2}$	10-24	12-18	18	.294	$\frac{19}{64}$
4	12-24	12-24	20	.320	$\frac{21}{64}$
$4\frac{1}{2}$	14-24	14-24	24	.372	$\frac{3}{8}$
5	14-24	14-24			

Mc 007 6 40

AMERICAN STANDARD PLUMBING SYMBOLS



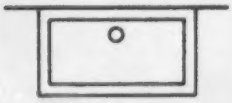
Corner Bath



Corner Lavatory

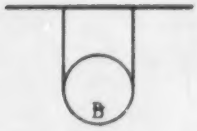
Water Heater

Roll Rim Bath

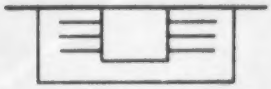


Kitchen Sink

Meter

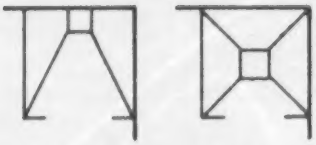


Bidet

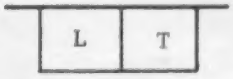


Kitchen Sink
R & L Drain Board

Hose Faucet



Shower Stall



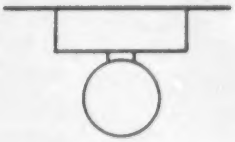
Laundry Tray

Gas Outlet

Wash Sink

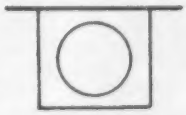
Drain

Shower Head



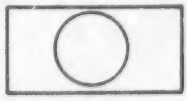
Water Closet

Roof Sump



Wall Lavatory

Hot Water Tank



Pedestal Lavatory

TEST

1. What is a blueprint?
2. What size windows are required for the living room of the house we have shown?
3. How many closets are shown in the plans?
4. What kind of door is to be installed between kitchen and dining room?
5. What is the difference between elevation and plan views?
6. How many doors are required on the hall closet?
7. How many steps are shown near rear entrance door?
8. What fixtures are required in the bathroom?
9. How many exterior doors are shown?
10. What kitchen equipment is required?
11. How many interior doors are shown?
12. How many risers are there in the stairway between the basement and the main floor?
13. Where are sliding doors specified in the floor plan of this house?
14. In what direction does the living room face?
15. Where is the interior stairway for the basement located?
16. How many ordinary doors are shown?
17. What type of roof is the garage roof?
18. Is the floor level of the garage and the house the same?
19. Would the south elevation show the rear of the house?
20. How many garage doors are required?
21. What type of roofing is used?
22. What types of window are required in the garage? kitchen? bathroom?
23. What shape is the house?
24. How many elevation drawings are necessary for an average house?
25. How many windows are on the front (south) elevation?
26. How many windows are required for the entire house?
27. What type of window is shown on the east elevation?
28. How many windows are on east elevation?
29. Are any exterior steps necessary and where?
30. Are louvers required?

31. How many steps are shown near the front door?
32. What type and size kitchen window is required?
33. Is there a door between the hall and living room?
34. How many D.H. windows are shown?
35. Is there an exterior door in the kitchen?
36. What direction do the joists run?
37. How many louvre doors are required on the bedroom closet?